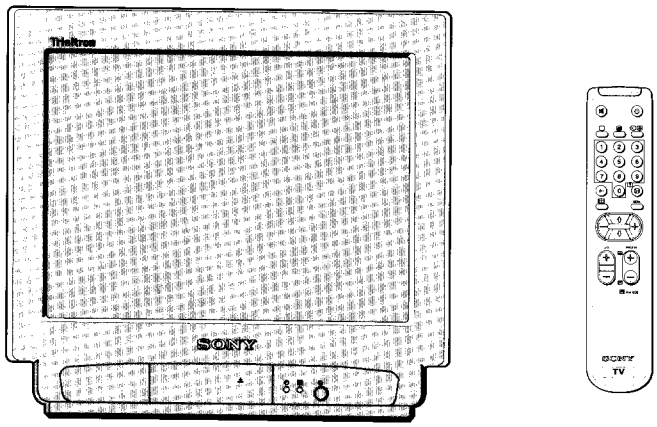
SERVICE MANUAL

BE-4 CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-M2180A	RM-836	Italian	SCC-J05C-A	KV-M2180E	RM-836	Spanish	SCC-J04C-A
KV-M2180B	RM-836	French	SCC-J06C-A	KV-M2181E	RM-836	Spanish	SCC-J04D-A
KV-M2181B	RM-836	French	SCC-J06D-A	KV-M2180K	RM-836	OIRT	SCC-J03E-A
KV-M2180D	RM-836	AEP	SCC-J08D-A	KV-M2181K	RM-836	OIRT	SCC-J03D-A
KV-M2181D	RM-836	AEP	SCC-J08C-A	KV-M2181U	RM-836	UK	SCC-J01C-A



MICROFILM

TRINITRON® COLOR TV

SONY®

ITEM MODEL	Television System	Channel Coverage	Colour System
Italian	B/G/H	VHF: E2-E12, S1-S20 UHF: E21-E69	PAL
French	B/G/H, L	VHF: E2-E12, S1-S20, S21-S41, F2-F10, B-Q UHF: E21-E69, F21-F69	PAL, SECAM
AEP	B/G/H	VHF: E2-E12, S1-S20, S21-S41 UHF: E21-E69	PAL, SECAM
Spanish	B/G/H	VHF: E2-E12, S1-S20, S21-S41 UHF: E21-E69	PAL
OIRT	B/G, D/K	B/G VHF: E2-E12 UHF: E21-E69 Hyper: S1-S41 D/K VHF: R01-R12 UHF: R21-R69	PAL, SECAM NTSC3.58/4.43 (video input only)
UK	I	UHF: 21-69	PAL

MODEL	Italian	French	AEP	Spanish	OIRT	UK
Power Consumption	58W	58Wh	58W	58W	58W	75W

SPECIFICATIONS

Picture Tube — Hi-Black Trinitron
Approx. 55 cm (21 inches)
(Approx. 51 cm picture measured diagonally)
100° -deflection

Input/Output Terminals

[INPUTS]

21-pin connector (CENELEC standard)
- audio / video input
- RGB input

[OUTPUTS]

Ω Headphone jack : minijack

Sound output	4W (RMS) 5W (music power)
Dimensions	513x475x475 mm approx.
Weight	Approx. 21.0kg
Supplied accessories	RM-836 Remote Commander (1) IEC designated batteries (2)
Other features	TELETEXT (KV-M2181B/M2181D/M2181E/M2181K/M2181U only)

[RM-836]

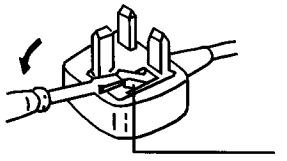
Remote control system	infrared control
Power requirements	3V dc (2 batteries) R6 (size AA)
Dimensions	Approx. 210x45x24 mm (w/h/d)
Weight	Approx. 90g (Not including batteries)

Design and specifications are subject to change without notice.

Item \ Model name	KV-M2180A	KV-M2180B KV-M2181B	KV-M2180D KV-M2181D	KV-M2180E KV-M2181E	KV-M2180K KV-M2181K	KV-M2181U
Pal Comb	OFF	OFF	OFF	OFF	OFF	OFF
PIP	OFF	OFF	OFF	OFF	OFF	OFF
RGB Priority	ON	ON	ON	ON	ON	ON
Woofer Box	OFF	OFF	OFF	OFF	OFF	OFF
Scart 1	ON	ON	ON	ON	ON	ON
Scart 2	OFF	OFF	OFF	OFF	OFF	OFF
Front in (3)	OFF	OFF	OFF	OFF	OFF	OFF
Scart 4	OFF	OFF	OFF	OFF	OFF	OFF
Projector	OFF	OFF	OFF	OFF	OFF	OFF
AKB in 16:9 mode	OFF	OFF	OFF	OFF	OFF	OFF
Norm B/G/H	ON	ON	ON	ON	ON	OFF
Norm I	OFF	OFF	OFF	OFF	OFF	ON
Norm D/K	OFF	OFF	OFF	OFF	ON	OFF
Norm AUS	OFF	OFF	OFF	OFF	OFF	OFF
Norm L	OFF	ON	OFF	OFF	OFF	OFF
Norm SAT	OFF	OFF	OFF	OFF	OFF	OFF
Norm M	OFF	OFF	OFF	OFF	OFF	OFF
Language Preset	Italian	French	German	Spanish	OIRT	English

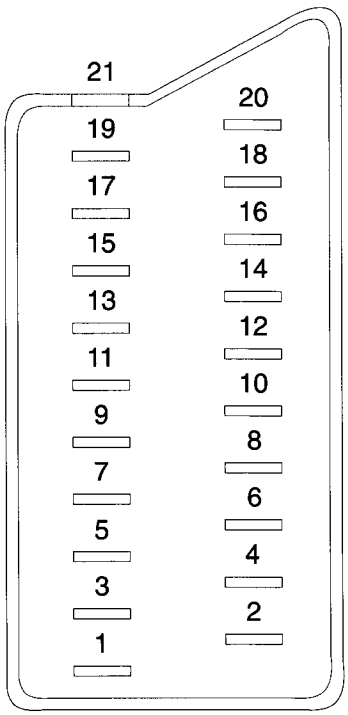
WARNING (KV-M2181U only)

The flexible mains lead is supplied connected to a **B.S. 1363** fused plug having a fuse of **5 AMP** capacity. Should the fuse need to be replaced, use a **5 AMP FUSE** approved by **ASTA** to **BS 1362**, ie one that carries the ASTA mark.
IF THE PLUG SUPPLIED WITH THIS APPLIANCE IS NOT SUITABLE FOR YOUR SOCKET OUTLETS IN YOUR HOME.
IT SHOULD BE CUT OFF AND AN APPROPRIATE PLUG FITTED.
THE PLUG SEVERED FROM THE MAINS LEAD MUST BE DESTROYED AS A PLUG WITH BARED WIRES IS DANGEROUS IF ENGAGED IN A LIVE SOCKET OUTLET.
When an alternative type of plug is used it should be fitted with a **5 AMP FUSE**, otherwise the circuit should be protected by a **5 AMP FUSE** at the distribution board.



How to replace the fuse.
Open the fuse compartment with the screwdriver blade and replace the fuse.

21 pin connector (1)



Pin No		Signal	Signal level
1	○	Audio output B (right)	Standard level: 0.5Vrms Output impedance:less than 1kohm*
2	○	Audio input B (right)	Standard level:0.5Vrms Input impedance:More than 10kohms*
3	○	Audio output A (left)	Standard level:0.5Vrms Output impedance:less than 1kohm*
4	○	Ground (audio)	
5	○	Ground (blue)	
6	○	Audio input A (left)	Standard level:0.5Vrms Input impedance:More than 10kohms*
7	○	Blue input	0.7V±3dB, 75ohms, positive
8	○	Function select (AV control)	High state (9.5—12V):Part mode Low state (0—2V):TV mode Input impedance:More than 10kohms Input capacitance:Less than 2nF
9	○	Ground (green)	
10	○	Open	
11	○	Green	Green signal:0.7V±3dB. 75ohms, positive
12	○	Open	
13	○	Ground(red)	
14	●	Ground (blanking)	
15	○	Red input	0.7V±3dB, 75ohms, positive
	—	(S signal) croma input	0.3V±3dB, 75ohms, positive
16	○	Blanking input (Ys signal)	High state (1—3V) Low state (0—0.4V) Input impedance:75ohms
17	○	Ground (video output)	
18	○	Ground (video input)	
19	○	Video output	1V±3dB, 75ohms, positive Sync:0.3V(–3, +10dB)
20	○	Video input	1V±3dB, 75ohms, positive Sync:0.3V(–3, +10dB)
	—	Video Input/Y (S signal)	1V±3dB, 75ohms, positive Sync:0.3V(–3, +10dB)
21	○	Common ground (plug, shield)	

○ Connected ● Not Connected (open) * at 20Hz - 20kHz

TABLE OF CONTENTS

CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

ATTENTION

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURT-CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

WARNING !!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS.
THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

ATTENTION !!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÁSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE.
LE CHÁSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND, IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!

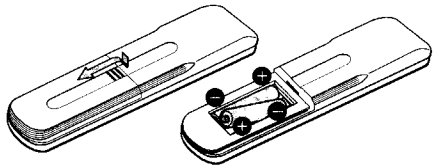
LES COMPOSANTS IDENTIFIÈS PAR UNE TRAME ET PAR UNE MARQUE ⚠ SUR LES VUES EXPLOSÉES ET LES LISTES DE PIECES SONT D'UNE IMPORTANCE CRITIQUE PUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÉCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY.

SECTION 1 GENERAL

Getting Started

Step 1

Inserting the Batteries into the Remote Commander



Step 2

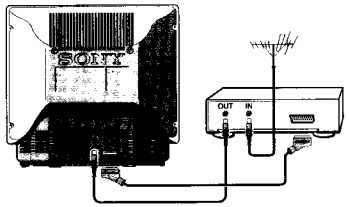
Connecting the Aerial

If you connect a VCR, skip to step 3.

Connect an external aerial to the socket X.

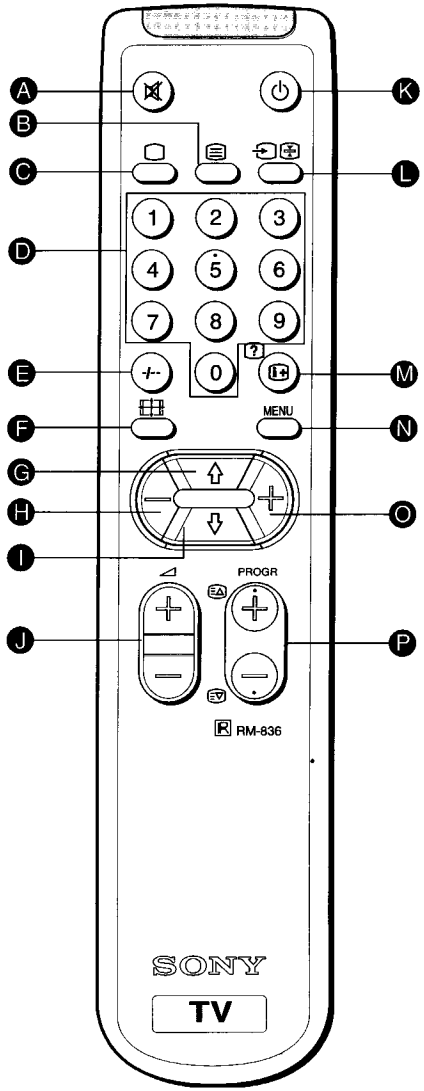
Step 3

Connecting a VCR



- It is recommended to tune in the VCR signal to programme number "0". For details, see "Presetting Channels Manually" on page 12.

The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual.



Step 4

Presetting Channels Automatically

TV searches for all available channels. If manual tuning is preferred see Menu option - Presetting Channels Manually.

1 Plug into mains.
Press power switch ⏻ W on TV set.

2 Press and hold ⏭ S on TV set for 2 seconds.
Auto tuning starts and screen shows.

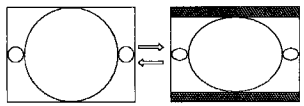
Notes
- When Auto tuning stops the programme on position 1 is seen.
- Channels are automatically stored as follows:

Programme 1 BBC1
Programme 2 BBC2
Programme 3 ITV
Programme 4 CH4 or S4C

TV Operation

This section explains functions used whilst watching TV. Most operations are carried out using the Remote Commander.

To	Press
Switch on	⏻ W on TV
Switch off temporarily	⏻ K *TV is now in standby mode, ⏻ indicator V on TV lights.*
Switch on again	▭ C, PROGR +/- P U or any number button D
Switch off completely	⏻ W on TV *To save energy we recommend switching off completely when TV is not in use.*
Select programmes	PROGR +/- P U or number buttons D *For double digit numbers press -/-- E then the number e.g. For 23, press -/-- E then 2 and 3.*
Display the programme number	ⓘ M *Press again to make programme number disappear.*
Adjust the volume	◿ +/- J T
Mute the sound	🔇 A *Press again to restore sound.*
View video input	⏏ L R *Press again to return to TV programme.*
View programmes in 16:9 mode	▦ F *Press again to return to 4:3 mode.*



Note: ▦ 6 is to be used to optimise the viewing of 16:9 signals which will be available in the future.

Viewing Teletext

Teletext is an information service broadcast by TV stations.

1 Select the channel which carries the teletext service you wish to receive.

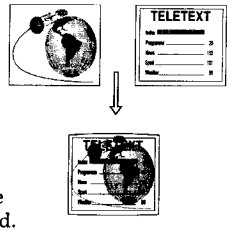
2 Press ▤ Ⓑ to switch on teletext.

3 Input three digits for the page number using the programme number buttons Ⓓ or PROGR +/- ⓅⓊ.

4 Press ▢ Ⓒ to switch off teletext.

Note • Teletext errors may occur if the broadcasting signals are weak.

Using Other Teletext Functions



Superimposing teletext on the TV

Press ▤ Ⓑ once in teletext mode or twice in TV mode to superimpose teletext on the TV screen.
Press ▤ Ⓑ again to cancel superimposing.

Freezing a teletext subpage

Press ⊕ Ⓛ (HOLD) to freeze the subpage. Freezing the page prevents the information that is displayed from being updated.
Press ⊕ Ⓛ to cancel HOLD and allow update to continue.

Revealing concealed information (eg: answers to a quiz)

Press ? Ⓜ to reveal information.
Press again to conceal the information.

Using colour buttons to access pages

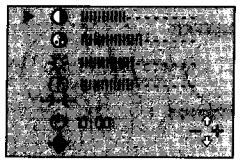
When the colour coded menu appears at the bottom of a page, press the colour button (red, green, blue or yellow) ⒼⒽⒾⓄ to access the corresponding page.

Note • A programme status message in a blue box may appear when you change programmes (depends on broadcasters).

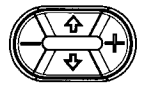
Use buttons on Remote Commander to control Menu screen.

MENU Ⓝ
Menu Screen on/off

Green Ⓖ
scroll up



Red Ⓗ
decrease



Yellow Ⓞ
increase/confirm(OK)

Blue Ⓘ
scroll down

Adjusting the Picture

1 Press MENU Ⓝ.

2 Press green Ⓖ or blue Ⓘ button to select the item you wish to change.

Symbol	Item	-	Effect	+
◑	Picture	Less		More
◕	Colour	Less		More
☼	Brightness	Darker		Brighter
◫	Sharpness	Softer		Sharper

3 Press red Ⓗ or yellow Ⓞ button to change levels.

4 Press MENU Ⓝ to return to normal TV screen.

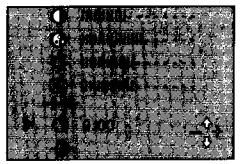
Note • To reset to factory preset picture levels, press green Ⓖ or blue Ⓘ button to select →•← and press yellow (OK) Ⓞ button.

Using the Sleep Timer

The TV may be set to switch to the standby mode automatically after a length of time chosen by you. You may set the time in 30 minutes steps up to 4 hours.

1 Press MENU ⓝ.

2 Press green Ⓖ or blue Ⓘ button to select ⏻.



3 Press red Ⓗ or yellow Ⓞ button to set time delay.
0.00 (OFF) 0.30 1.00 1.30 .... 4.00

4 Press MENU ⓝ to return to normal TV screen.
When watching TV, press ⓣ Ⓜ to display time remaining.

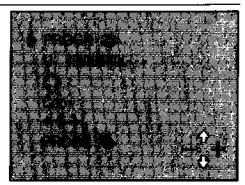
Presetting Channels Manually

Up to 60 programme positions are available for presetting channels.

1 Press MENU ⓝ.

2 Press green Ⓖ or blue Ⓘ button to select ⇨ and press yellow (OK) Ⓞ button.

3 Select programme number using PROGR +/- ⓟⓤ or the number buttons Ⓓ.



4 Press green Ⓖ or blue Ⓘ button to select tuning bar (||||||····) and press red Ⓗ or yellow Ⓞ button to start channel search. When a channel is found the tuning bar stops moving and you see the picture.

5 If you want to store, press green Ⓖ or blue Ⓘ button to select ◇ and press yellow (OK) Ⓞ button. If you do not want to store, press red Ⓗ or yellow Ⓞ button to continue search.

6 Repeat steps 3 to 5 for all other channels.

7 Press MENU ⓝ to return to normal TV screen.

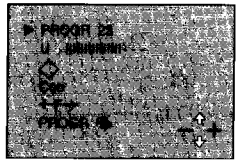
Skipping Programme Positions

You can skip unused programme positions when selecting channels with the PROGR +/- P U buttons. You can still select them, however, using the number buttons D.

1 Press MENU N.

2 Press green G or blue I button to select ⇨ and press yellow O button.

3 Select programme number you want to skip using PROGR +/- P U button or number buttons D.



4 Press green G or blue I button to select Coo and press yellow (OK) O button.

5 Press green G or blue I button to select ◇ and press yellow (OK) O button to store.

6 Repeat steps 3 to 5 for other unused programme positions.

7 Press MENU N to return to normal TV screen.

Note • To restore a skipped programme number, refer to "Presetting Channels Manually".

Fine-Tuning Channels

You can fine tune a stored channel if necessary.

1 Select the channel you wish to fine tune.

2 Press MENU N.

3 Press green G or blue I button to select ⇨ and press yellow (OK) O button.

4 Press green G or blue I button to select ←F→ and use red H or yellow O button to adjust tuning.

5 Press green G or blue I button to select ◇ and press yellow (OK) O button to store.

6 Press MENU N to return to normal TV screen.

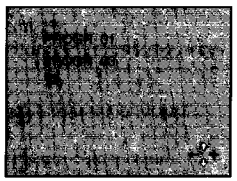
Exchanging Programme Positions

After tuning you may wish to rearrange the programme positions.

1 Press MENU ⓝ.

2 Press green Ⓖ or blue Ⓘ button to select ⇳ and press yellow (OK) Ⓞ button.

3 Press green Ⓖ or blue Ⓘ button to select PROGR and press yellow (OK) Ⓞ button.



4 Press red Ⓗ or yellow Ⓞ button to select the first programme position.

5 Press the blue Ⓘ button.

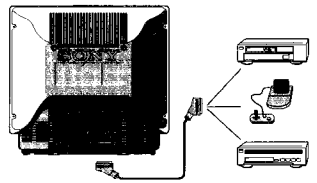
6 Press the red Ⓗ or yellow Ⓞ button to select the second programme position.

7 Press blue Ⓘ button to select and press yellow (OK) Ⓞ button to exchange.

8 Repeat steps 4 to 7 for other programme positions.

9 Press MENU ⓝ to return to normal TV screen.

Using the 21-pin Connector



Your TV has one 21-pin connector Ⓨ on the rear of the set. You can connect optional audio or video equipment to this connector, such as a VCR, video games or a video disc player.

1 Press ⇥ Ⓛ Ⓡ to view the video input signal.

2 Press ⇥ Ⓛ Ⓡ or ▢ Ⓒ to return to normal TV screen.

Connecting Headphones

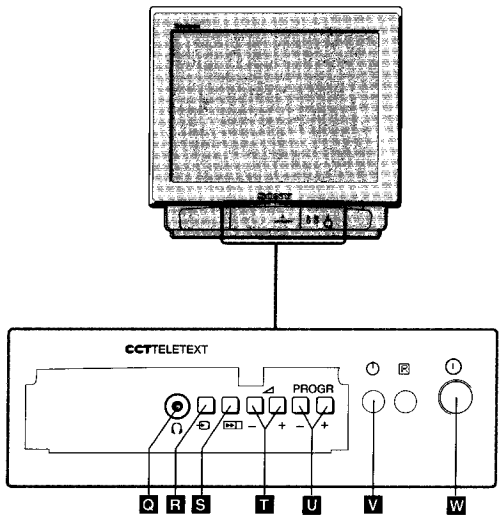
Plug in the headphones to the ∩ Ⓠ socket on the front of the TV set, then the sound from the speaker is muted.

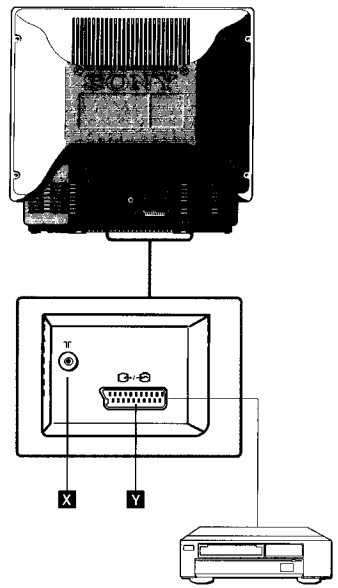
Troubleshooting

Here are some simple solutions to the problems which affect the picture and sound.

Problem	Solution
No picture, screen is dark, no sound	• Plug the TV in. • Press ⏻ W on the TV. • Press ▢ C or the programme number D on the remote commander if ⏻ indicator V is on. • Check the aerial connection. • Check that the video source is on. • Turn the TV off for 3 or 4 seconds and then turn it on again using ⏻ W.
Poor or no picture (screen is dark, sound is good)	• Press MENU N and adjust brightness picture and colour levels.
Good picture, no sound	• Adjust the volume ◿ +/– J T . • Disconnect any headphones. • Press 🔇 A if 🔇 is displayed on the screen.
No colour on colour programmes	• Press MENU N and adjust colour balance. • Press MENU N and reset to factory settings.
Distorted picture when you change programmes or select teletext	• Turn off the equipment connected to the 21-pin connector Y.
Remote commander does not function	• Replace the batteries.

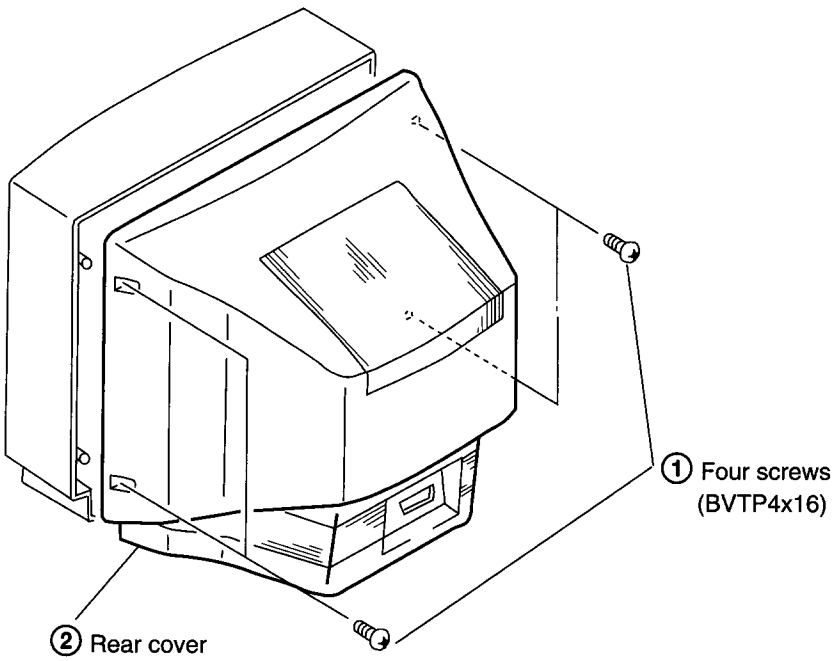
- **If you continue to have these problems, have your TV serviced by qualified personnel.**
- **NEVER open the casing yourself.**



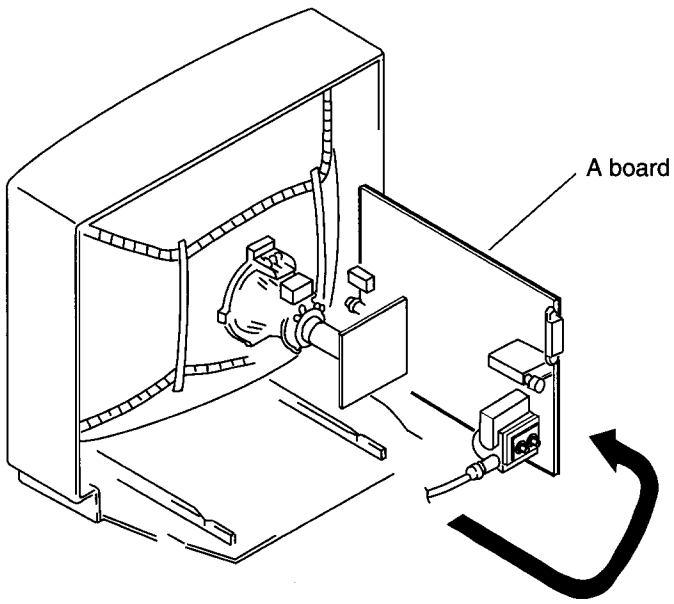


SECTION 2
DISASSEMBLY

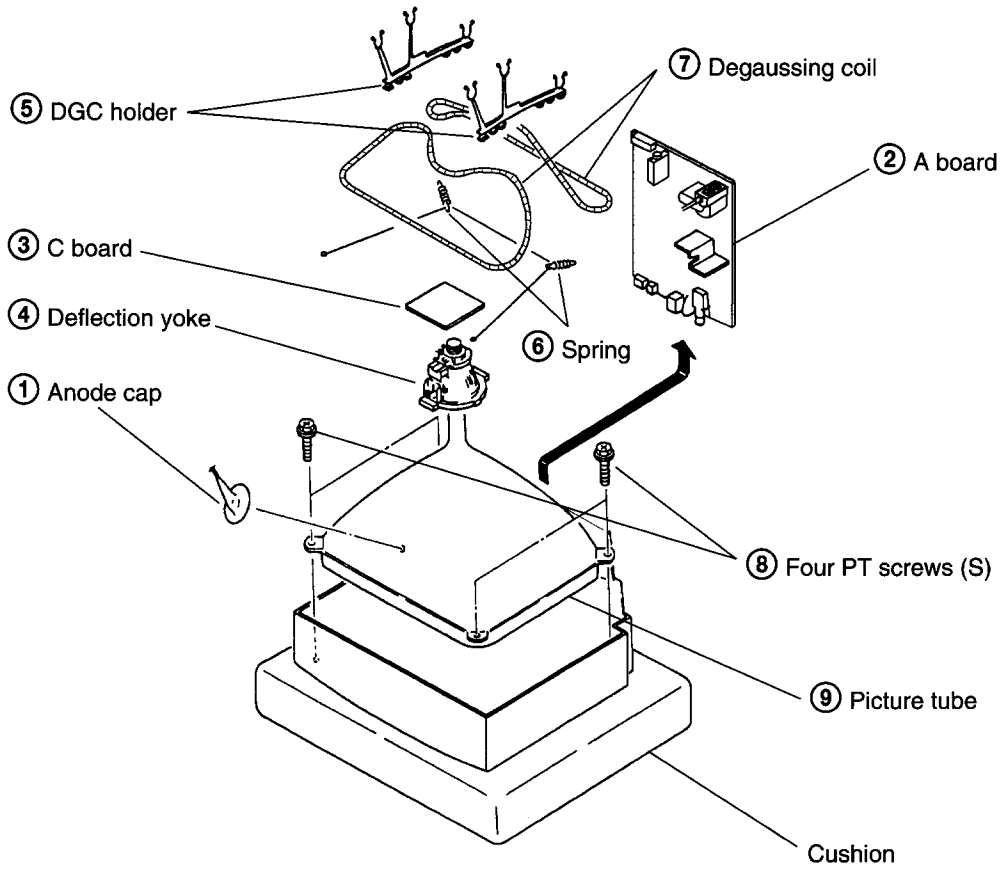
2-1. REAR COVER REMOVAL



2-2. SERVICE POSITION



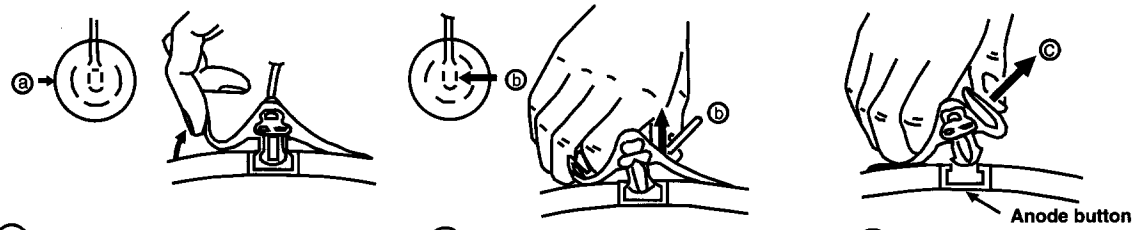
2-3. PICTURE TUBE REMOVAL



• REMOVAL OF ANODE-CAP

Note: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT, after removing the anode.

*** REMOVING PROCEDURES.**



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ

② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ

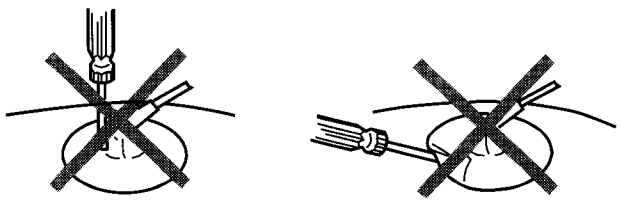
③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling it up in the direction of the arrow ⓒ

• HOW TO HANDLE AN ANODE-CAP

① Don't damage the surface of anode-cap with sharp shaped material !

② Don't press the rubber hardly not to hurt inside of anode-caps !
A metal fitting called as shatter-hook terminal is built into the rubber.

③ Don't turn the foot of rubber over hardly !
The shatter-hook terminal will stick out or damage the rubber.



SECTION 3
SET-UP ADJUSTMENTS

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed.
- These adjustments should be performed with the rated power supply voltage, unless otherwise noted.

The Contrast and Brightness controls should be set as follows unless otherwise noted:

◑ CONTRAST control 80%
(or Normal by commander)
☼ BRIGHTNESS control 50%

Perform the adjustments in the following order:
1. Beam Landing
2. Convergence
3. Screen (G2), Drive, White Balance, Sub Colour and Sub Brightness.
4. Focus

Note: Test Equipment Required.
1. Colour bar/Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital multimeter
5. Oscilloscope

Preparation:
- In order to reduce the influence of external magnetic forces on the picture tube, face the TV set in an easterly or westerly direction.
- Turn the power switch for the unit ON and erase the magnetic force using a degausser.

3-1. BEAM LANDING

Demagnetize with a degausser.
1. Input an all white raster signal from the pattern generator.
   CONTRAST } normal
   BRIGHTNESS }
2. Switch the raster signal of the pattern generator to Red.
3. Move the deflection yoke backward, and adjust with the purity control so that Red is at the centre and the Blue and Green are evenly spaced at the sides. see (Fig. 3-1 - 3-3)
4. Move the deflection yoke forward, and adjust so that the entire screen becomes Red. (Fig. 3-1)
5. Switch the raster signal to Blue and then Green to confirm the condition.
6. When the position of the deflection yoke has been determined, tighten it with the deflection yoke mounting screw.
7. When the landing at the corners is not correct, adjust by using disk magnets. (Fig. 3-4)

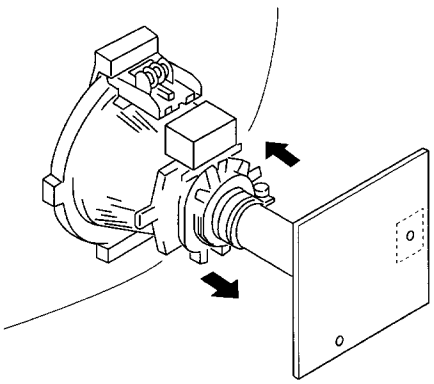


Fig. 3-1

Fig. 3-2

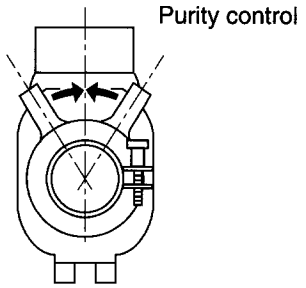


Fig. 3-3

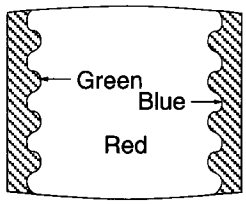
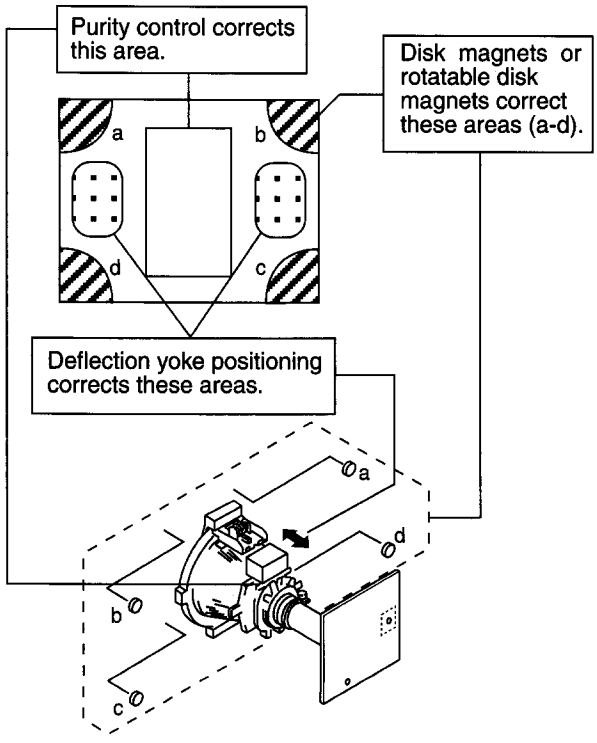


Fig. 3-4

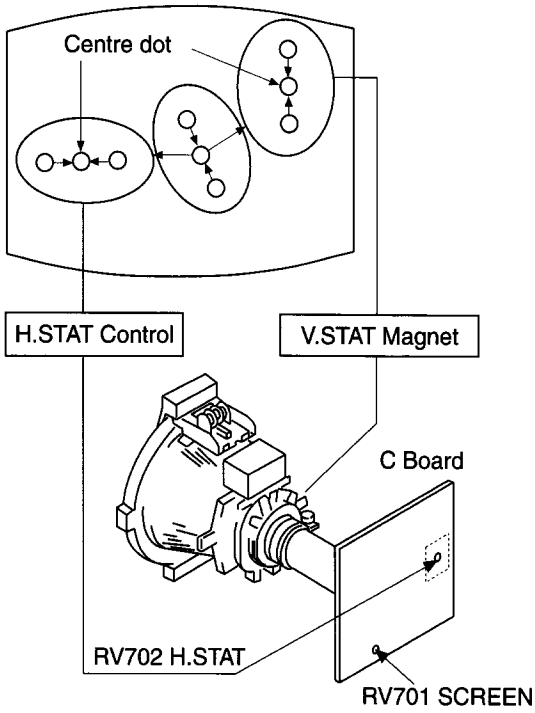


3-2. CONVERGENCE

Preparation:

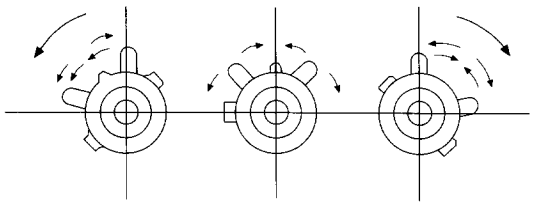
- Before starting, perform FOCUS, H.SIZE, and V.SIZE adjustments.
- Set the BRIGHTNESS control to minimum.
- Input a dot pattern from the pattern generator.

(1) Horizontal and Vertical Static Convergence

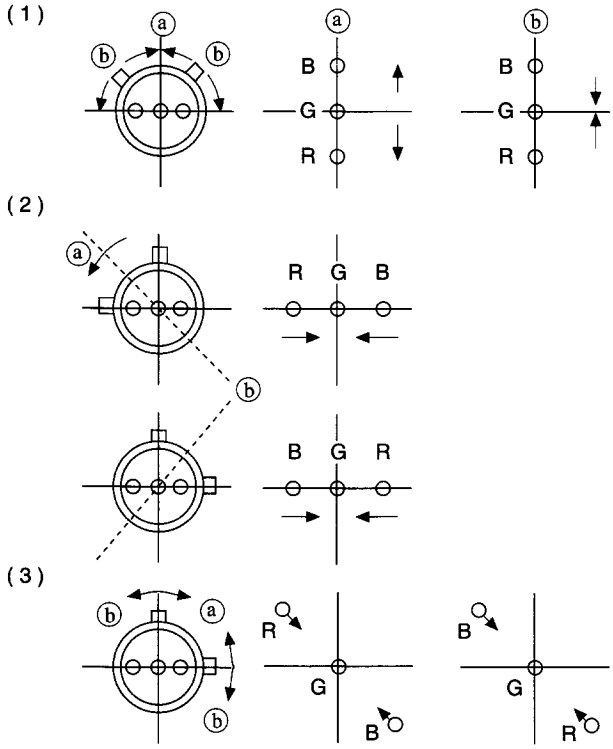


1. Adjust the H.STAT control to converge the Red, Green and Blue dots at the centre of the screen. (Horizontal movement)
2. Adjust the V.STAT magnet to converge the Red, Green and Blue dots at the centre of the screen. (Vertical movement)

- If the horizontal dots cannot coincide with variable range of the H.STAT convergence, adjust together with the V.STAT convergence while tracking.
  (Adjust the convergence by tilting the V.STAT convergence or by opening or closing the V.STAT convergence.)



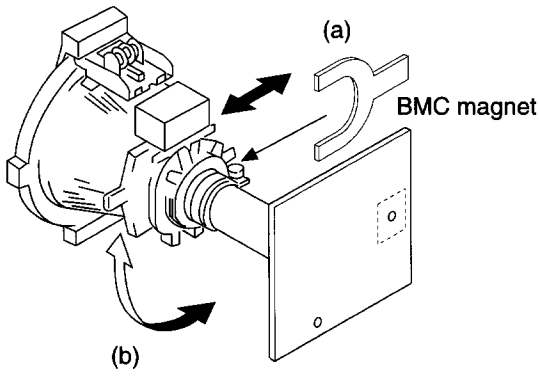
3. When the V.STAT magnet is moved in the direction of the (a) and (b) arrows, the Red, Green and Blue dots move as shown below.



If the Red and Blue dots do not converge with the Green dots, perform the following steps.

1. Move the BMC magnet (a) to correct for insufficient H.static convergence.
2. Rotate the BMC magnet (b) to correct for insufficient V.static convergence.

In either case, repeat the Beam Landing Adjustment.

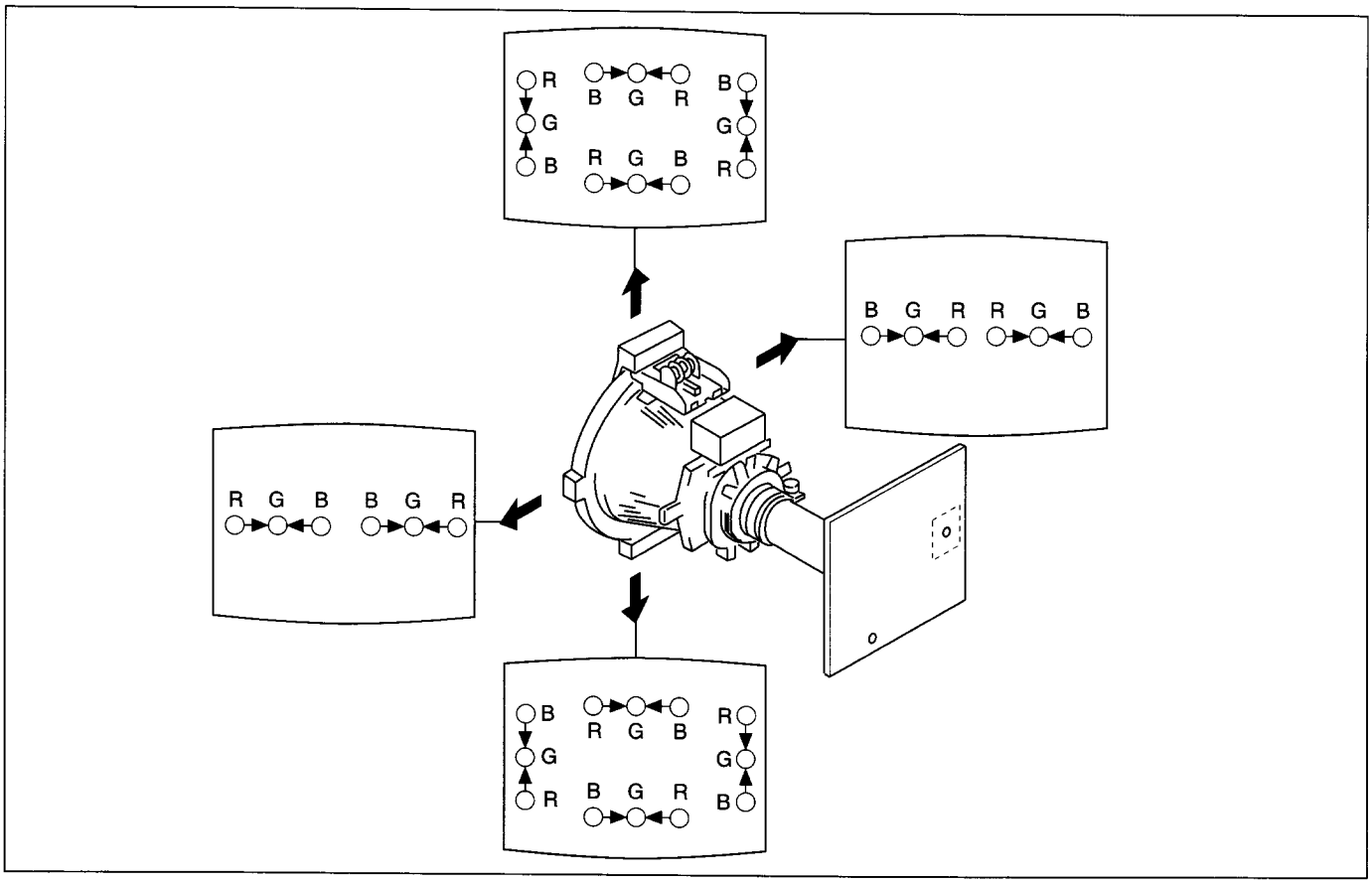


(2) Dynamic Convergence Adjustment

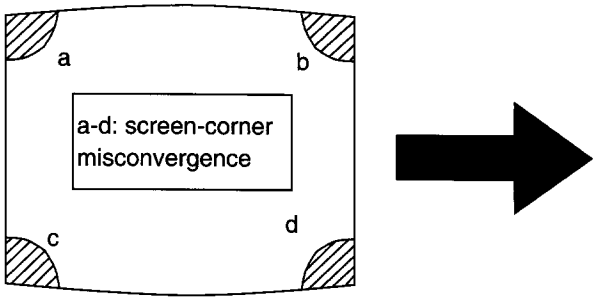
Preparation:

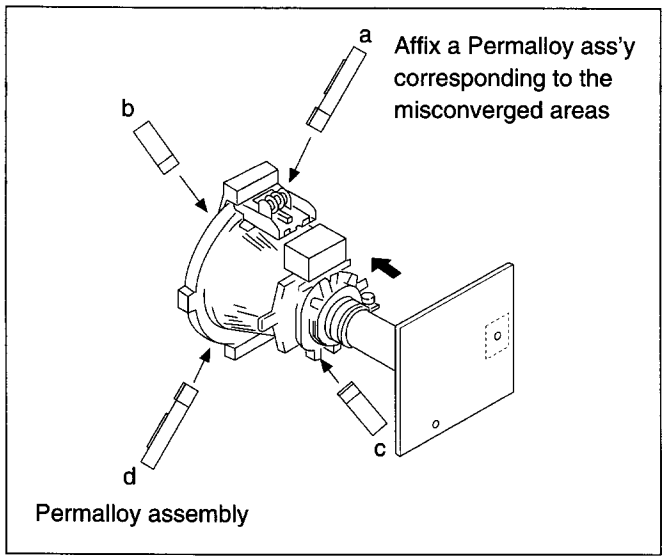
- Before starting, perform the Horizontal and Vertical static convergence adjustment.

1. Slightly loosen the deflection yoke screw.
2. Remove the deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below.
4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

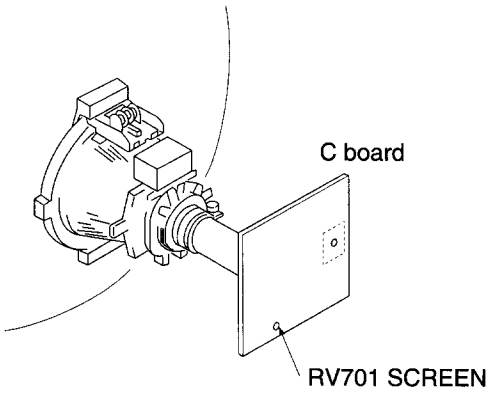


(3) Screen-corner Convergence.





3-3. SCREEN (G2), DRIVE, WHITE BALANCE, SUB COLOUR and SUB BRIGHTNESS.

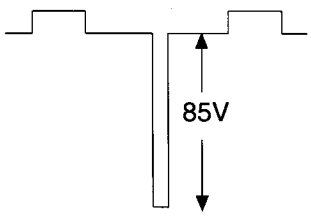


Screen (G2) setting

1. Input a 0 IRE (Black Level) signal from the pattern generator.
2. Enter into the Service Mode "Test""Test" and 38.
3. Adjust RV701 until the Down arrow is displayed.
4. Adjust RV701 until the Down arrow just disappears.
5. Press the TV Button on the Remote Commander to store the data.

Drive Level

1. Input a Video signal containing a small area of 100% white on a black background.
2. Connect an oscilloscope to Pin (10) of J701 (R OUT) on the C Board.
3. Set the Picture to maximum using "Test""Test" and 01.
4. Enter into the Service mode (Adjust Menu).
5. Using the Blue and Green buttons select "RED HWB".
6. Using the Red and Yellow buttons on the Remote Commander adjust until the oscilloscope waveform has an amplitude of 85V.

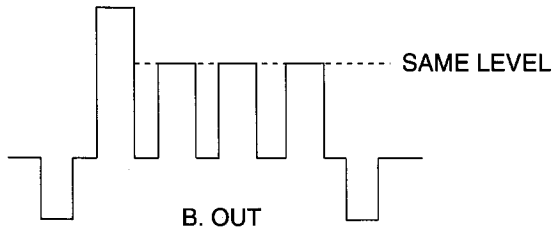


White Balance Adjustment

1. Input an all white pattern from the pattern generator.
2. Adjust the Colour and Brightness controls to the standard level.
3. Enter into the Service Mode.
4. Adjust the Green HWB and Blue HWB so that the White Balance becomes optimum.

Sub Colour Adjustment

1. Input a PAL colour bar pattern from the pattern generator.
2. Connect an oscilloscope to Pin (8) of J701 (B OUT) on the C Board.
3. Enter into the Service Mode "Test""Test" and 22.
4. Using the Red and Yellow buttons on the Remote Commander adjust until the oscilloscope waveform becomes as follows :



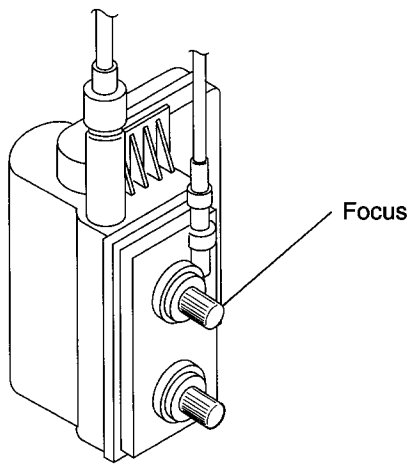
Note : If the TV is able to receive PAL and SECAM transmissions, repeat the above procedure using a Secam colour bar signal.

Sub Brightness Adjustment

1. Input a Philips pattern from the pattern generator.
2. Enter into the Service Mode "Test""Test" and 23.
3. Using the Red and Yellow buttons on the Remote Commander adjust until the 0 IRE of the grey scale and the cut off are only slightly visible on the screen.

3-4. FOCUS

1. Receive a television broadcast signal.
2. Normalize the picture setting.
3. Adjust the focus control on the flyback transformer for the best focus at the centre of the screen.
   Bring only the centre area of the screen into focus, the magenta-ring appears on the screen. In this case, adjust the focus to optimize the screen uniformly.



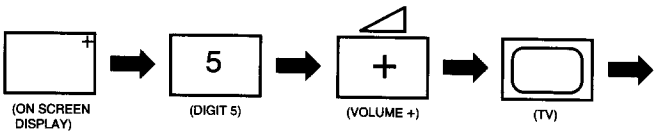
SECTION 4
CIRCUIT ADJUSTMENTS

4-1. ELECTRICAL ADJUSTMENTS

Service adjustment to this model can be performed with the supplied Remote Control Commander RM-836.

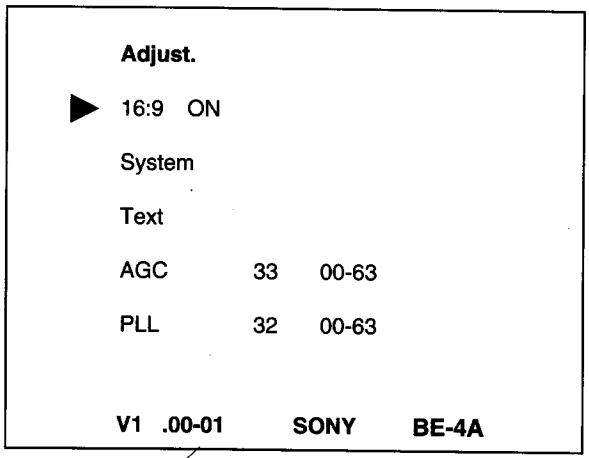
HOW TO ENTER INTO SERVICE MODE

1. Turn on the main power of the set and enter into stand-by mode.
2. Press the following sequence of buttons on the Remote Control Commander.



"TT-- " will appear in the top right corner of the screen Other status information will also be displayed.

3. Press the MENU button on the Remote Commander to obtain the menu on the screen.



4. Press the Blue (Next) or Green (previous) buttons to select the adjustment item from the table.
5. Press the Yellow (+) or Red (-) buttons to change the data as required.
6. Turn off the power to quit the service mode when adjustments are completed.

Range of adjustments available from the on screen menu system.

Adjustment	Set	Range
16:9 Off	Select	ON/OFF
System	Select	BG-L, BG-DK UK, Eire, BG
Text	Select	EAST/WEST
AGC	Adj.	00 - 63
PLL	Adj.	00 - 63
B&W Delay	Adj.	00 - 63
Ver Size	Adj.	00 - 63
Ver, Breath	00	00 - 63
Par, Ampl	00	00 - 63
Par, Tilt	32	00 - 63
V, Linear	Adj.	00 - 63
Corn, corr	00	00 - 63
V, Cen or EW	Adj.	00 - 63
V, Position	42	00 - 63
H, Centre	Adj.	00 - 63
Blue HWB	Adj.	00 - 63
Green HWB	Adj.	00 - 63
Red HWB	Adj.	00 - 63

4-2. TEST MODE 2:

TT -- Mode is available by pressing the Test button twice, O.S.D 'TT --' appears. The functions described below are available by pressing two digits. To release the 'TT --' mode, press 0 twice, press 'TEST' , press 'TV' or switch the TV into Stand-by mode.

00	Switch 'TT--' Mode off.
01	Set picture level to maximum.
02	Set picture level to minimum.
03	Set volume to 35%.
04	Set volume to 50%.
05	Set volume to 65%.
06	Set volume to 80%.
07	Ageing condition (picture max., brightness max.).
08	Shipping condition (Analog values are RESET to factory setting, Prog 1 is selected, TT--mode switched off, Vol = 35%).
09	Dummy.
10	No function.
11	Dummy
12	Text Picture Level Offset (Enable/Disable)
13	Select Odd / Even field for Non-interlaced teletext.
14	Select Interlaced / Non-interlaced teletext display.
15	Read factory setting from ROM to NVM - Reads Volume, Brightness, Picture, Hue, Sharpness and Colour values from ROM to the actual used values (Last Power Memory).
16	No function
17	Enable / Disable Sharpness Operation.
18	Enable / Disable Teletext Operation.
19	Enable / Disable NTSC Operation.
20	No function.
21	Sub Picture.
22	Sub Colour (Pal / Secam Different Stores)
23	Sub Brightness.
24	Destination System BG/L.
25	Destination Systems BG/L.
26	Destination Systems I.
27	Destination System I/I'.
28	Destination BG only.
29	Dummy.
30	No function.
31-32	Dummy.
33	Auto AGC Adjust.
34	Auto PLL Adjust.
35-37	Dummy.
38	Enter G2 adjustment mode.
39	Dummy.
40	No function.
41	Re-initialise NVM.
42	Dummy.
43	Re-initialise Geometry settings.
44-47	Dummy
48	Set NVM testbyte to 44h in NVM.
49	Erase NVM testbyte
50	No function.

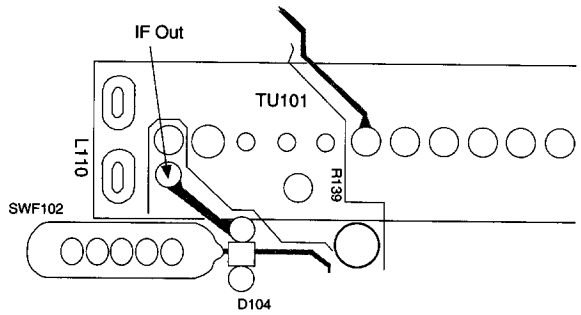
Note : For Test Modes 41 - 50, it is necessary to ensure that the TV is set to Prog 59.

IF ADJUSTMENT (AUTOMATIC)

1. Input a 38.9 MHz 100dBμ CW signal at the IF Out injection point.
2. Enter into service mode and press 34.
3. Connect a digital voltmeter to IC101 pin (23).
4. Check AFT 2.5V ±0.3V dc.
5. Press '00' on the Remote Commander.

SYSTEM L ADJUSTMENT (French Models)

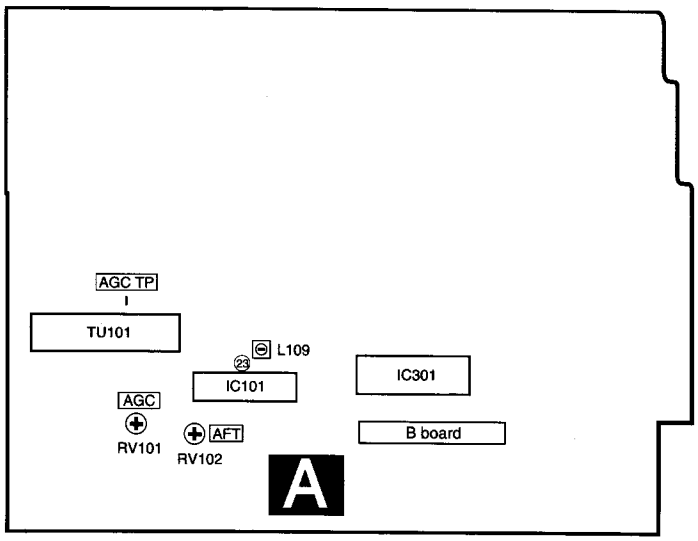
1. Input a 33.9MHz 100dBμ CW signal at the IF Out injection point.
2. From the On Screen Menu set System to L band 1.
3. Connect a digital voltmeter to IC101 pin (23).
4. Adjust RV102 AFT for 2.5V ±0.3V dc.



- A Board Print Side -

AGC ADJUSTMENT

1. Receive an off-air signal.
2. Enter into the Service adjust menu and select AGC.
3. Adjust the data using the Red and Yellow buttons on the Remote Commander so that there is no snow or cross - modulation visible on the screen.
4. Change the receiving off-air channel, and confirm the above status.



- A Board Component Side -

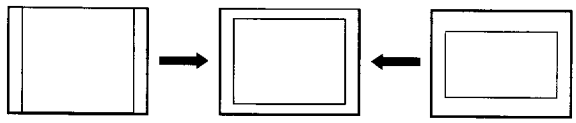
DEFLECTION SYSTEM ADJUSTMENT

1. Enter into the service mode.
2. Using the Blue or Green buttons select the Adjust item.
3. Press the Yellow button to enter the adjustment submenu.
4. Select and adjust each item in order to obtain the optimum image.

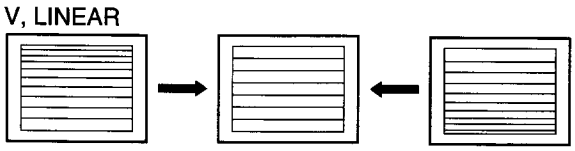
See Note on page 23

Adjustment	Set	Range
VERT, AMPL	Adj.	00 - 63
VER, BREATH	00	00 - 63
PAR, AMPL	00	00 - 63
PAR, TILT	32	00 - 63
V, LINEAR	Adj.	00 - 63
CORN, CORR	Adj.	00 - 63
V, CENTRE	Adj.	00 - 63
V, POSITION	42	00 - 63
H, CENTRE	Adj.	00 - 63

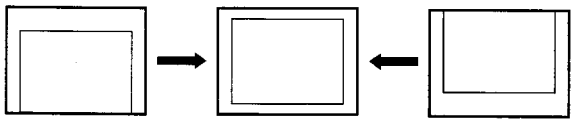
VERT, AMPL



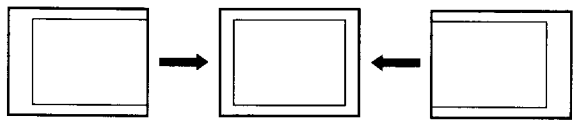
V, LINEAR



V, CENTRE



H, CENTRE



Fit the link as required to obtain the correct horizontal picture size.

4-3. BE-4 SELF DIAGNOSTIC SOFTWARE

The identification of errors within the BE-4 chassis is triggered in 1 of 2 ways :- 1: Bus busy or 2: Device failure to respond to I^2C. In the event of one of these situations arising the software will first try to release the Bus if busy (Failure to do so will report with a continuous flashing LED) and then communicate with each relevant device in turn to establish if a device is faulty. If a device is found to be faulty the relevant device number will be displayed through the LED by a Series of flashes which must be counted (See Table 1), Non fatal errors are reported with this method.

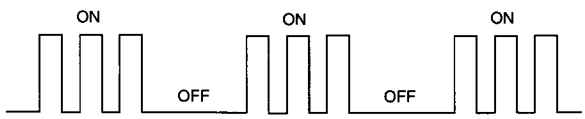
If a fatal error is found, the set will simply stay in whichever state it was when the error occurred, but if a non fatal error occurs the set will try to continue to operate.

Table 1

No of Flashes	Meaning
2	IC301 not acknowledging I²C transmission, NVM OK.
3	IC301 FAULT (Not OK) - flags
4	IC301 - No H Flyback
5	IC301 - Stack Overflow.
6	Overvoltage / Overcurrent Protection (Pin 52) high.
7	IC002 not acknowledging I²C transmission, IC301 OK.
8	IC002 and IC301 - No I²C acknowledgment.
9	General I²C Error (SDA or SCL being held low) (IC301, IC001, IC002, CN001)

Flash Timing Example : e.g. error number 3

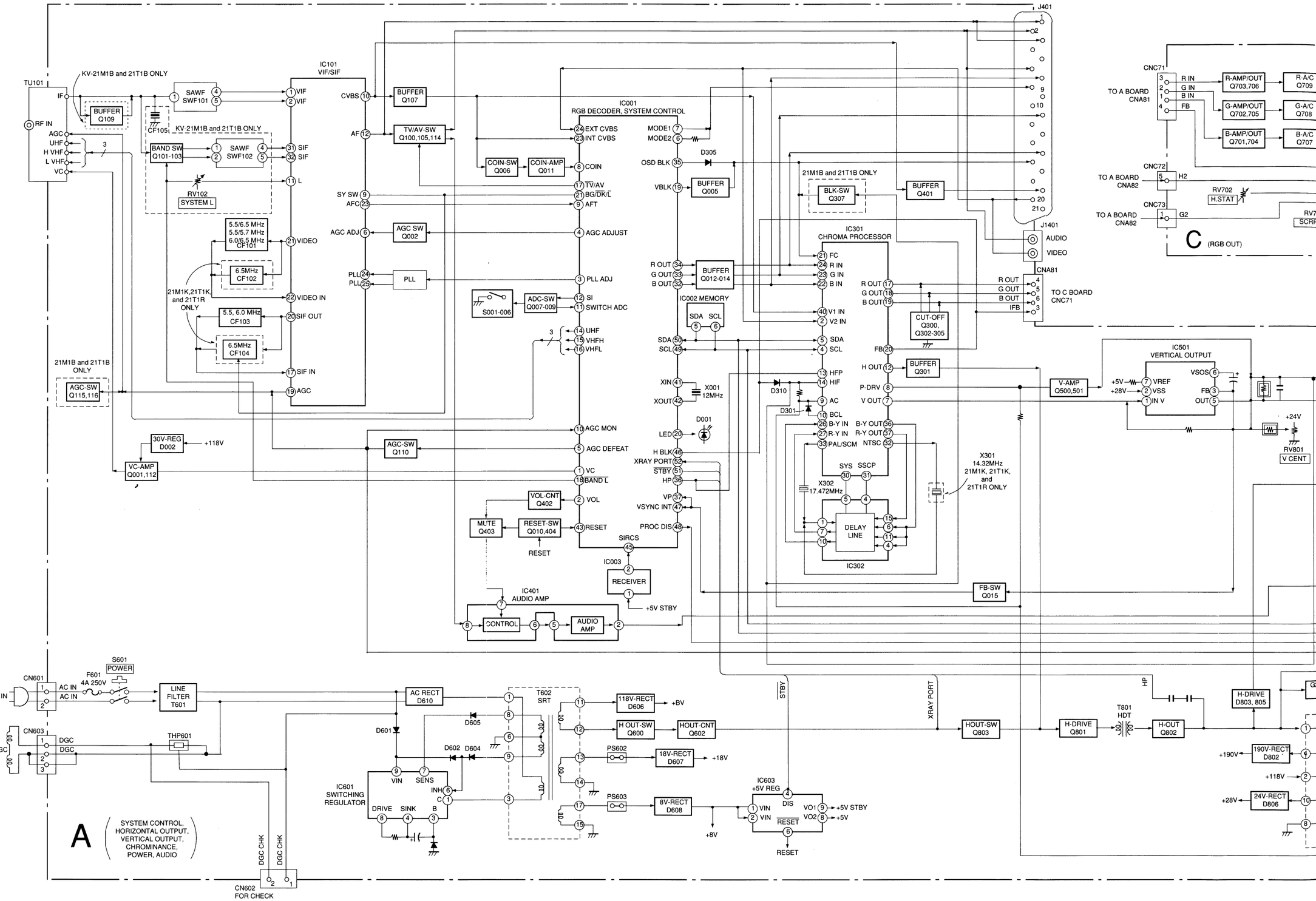
Stby LED

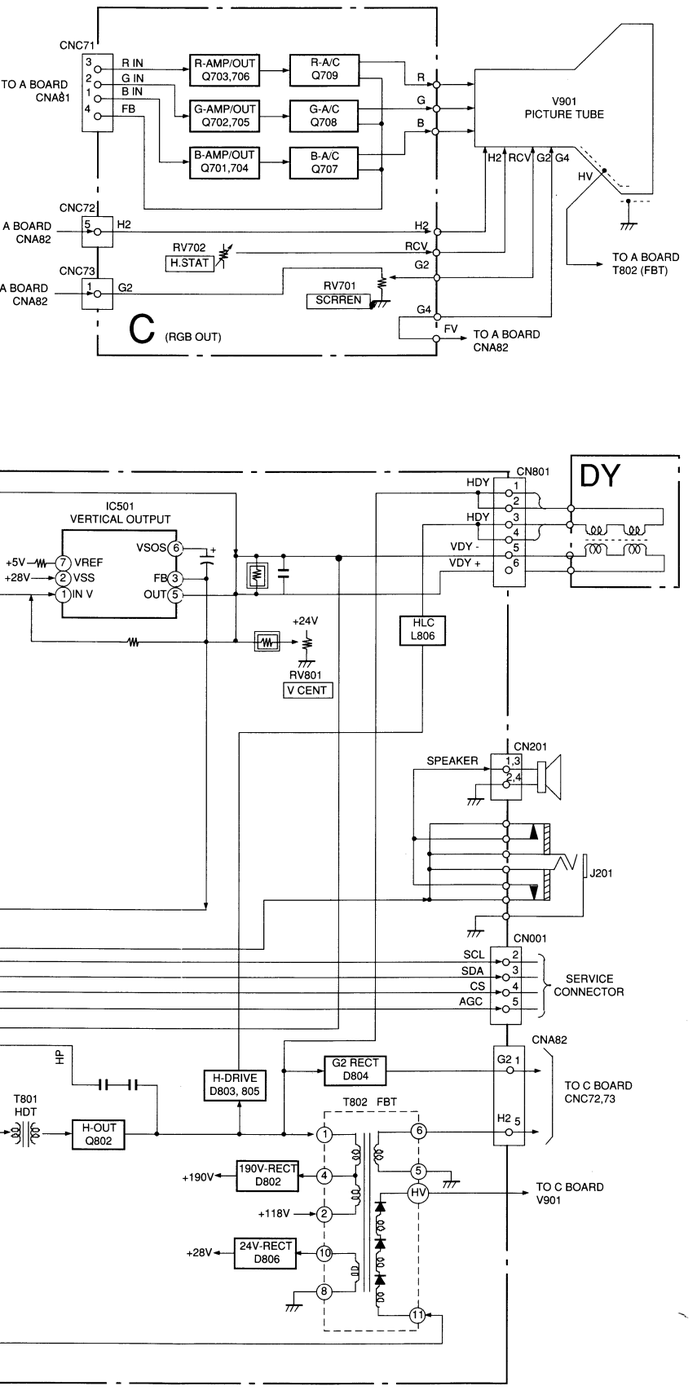


Note : Deflection System Adjustments should not be carried out whilst using an NTSC (60Hz) signal, or if the signal is unlocked.

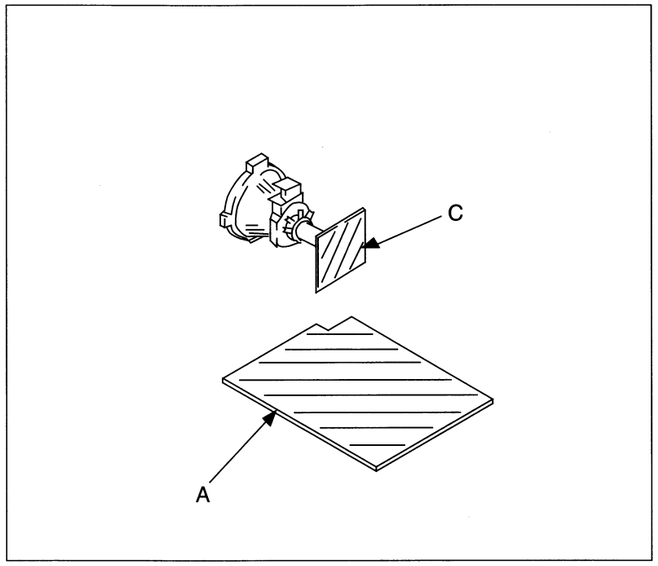
5-1. BLOCK DIAGRAM

SECTION 5
DIAGRAMS





5-2. CIRCUIT BOARDS LOCATION



5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.
  k = 1000 , M = 1000K
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5 mm
Rating electrical power ¼ W

- : nonflammable resistor.
- : internal component.
- : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : earth - ground.
- : earth - chassis.
- : no mounted.

Note : The components identified by shading and marked ⚠ are critical for safety. Replace only with the part number specified.

Note : Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ※	ADJUSTABLE RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

- Readings are taken with a colour-bar signal input.
- Readings are taken with 10MΩ digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
- : B+ bus.
- : signal path. (RF)

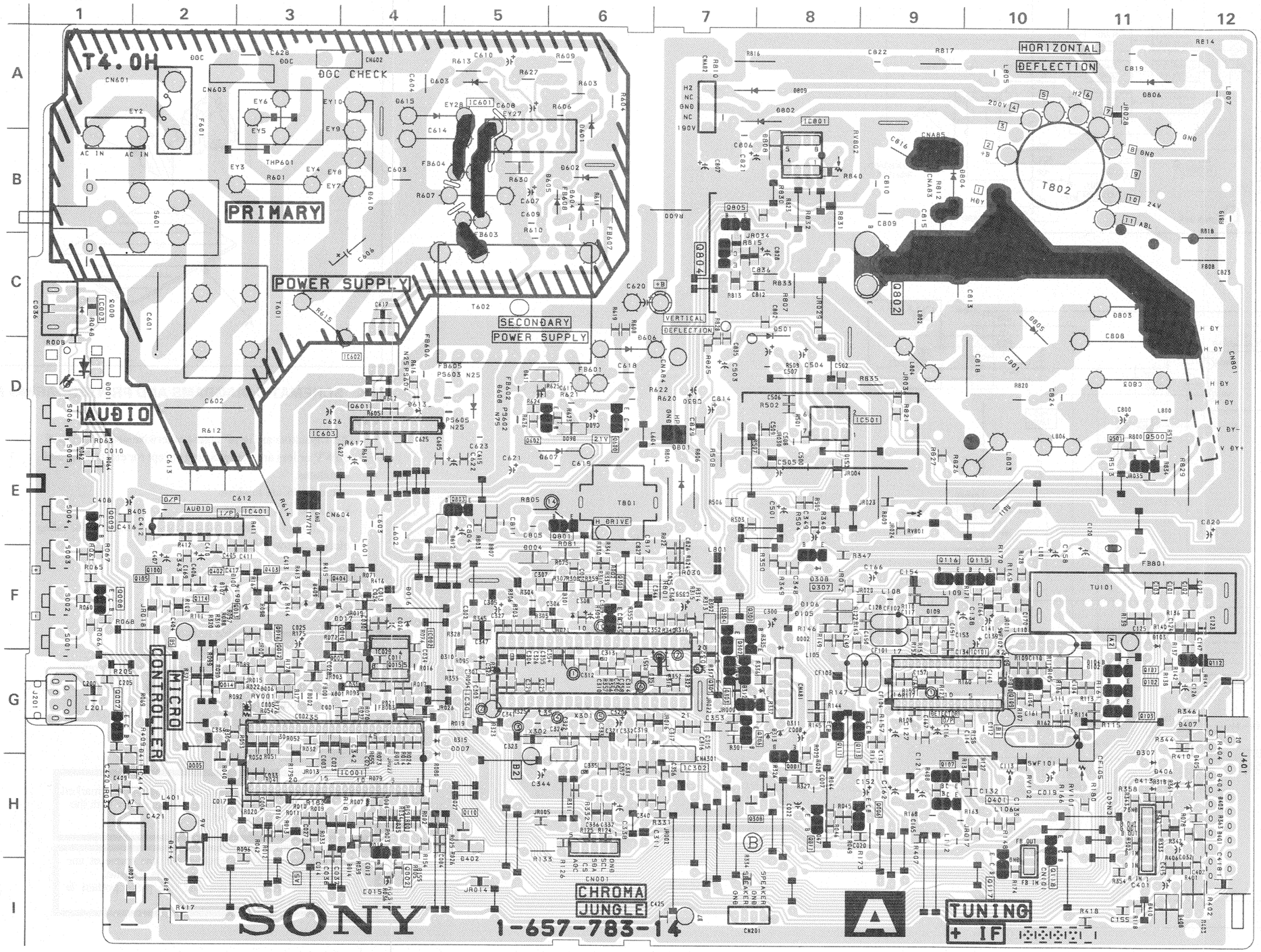
A BOARD

IC					
IC001	I-4	Q303	G-7	D402	H-5
IC002	G-4	Q304	F-7	D403	H-12
IC003	C-1	Q305	G-7	D404	H-12
IC101	G-10	Q306	G-8	D405	H-12
IC301	G-5	Q307	F-8	D406	H-11
IC302	H-7	Q308	H-7	D407	G-12
IC401	E-3	Q401	H-10	D408	I-12
IC501	D-9	Q402	F-2	D409	F-3
IC601	A-5	Q403	F-3	D410	I-11
IC603	D-3	Q404	F-4	D412	I-2
TRANSISTOR		Q600	D-6	D414	H-2
		Q602	D-6	D501	E-8
Q001	H-8	Q801	E-6	D600	D-6
Q002	I-4	Q802	C-9	D601	A-6
Q005	H-2	Q803	E-5	D602	B-6
Q006	H-9	Q804	C-7	D603	A-5
Q007	G-1	Q805	B-7	D604	B-6
Q008	F-1	**DIODE**		D605	B-6
Q009	E-1			D606	D-6
Q011	H-8	D001	D-1	D607	E-6
Q012	G-3	D002	F-8	D608	D-5
Q013	F-3	D003	C-1	D610	B-4
Q014	G-2	D004	F-5	D611	D-6
Q015	G-4	D005	G-4	D612	E-5
Q016	F-3	D006	G-3	D613	E-3
Q100	F-2	D014	I-4	D614	F-3
Q101	G-11	D016	G-4	D801	E-7
Q102	G-11	D100	F-3	D802	A-8
Q103	G-11	D102	G-11	D803	C-11
Q105	F-2	D104	G-11	D804	B-10
Q107	H-9	D105	F-8	D805	C-10
Q109	G-10	D106	F-8	D806	A-11
Q110	H-5	D107	F-2	D807	E-5
Q111	G-8	D109	F-9	D809	A-8
Q112	G-12	D301	F-6	**VARIABLE RESISTOR**	
Q113	G-9	D302	F-7		
Q114	F-2	D305	G-2	RV102	H-10
Q115	F-10	D307	G-11	RV801	E-9
Q116	F-9	D308	F-8		
Q300	F-7	D310	F-5		
Q301	F-6	D315	G-5		
Q302	F-7	D401	H-12		

A SYSTEM CONTROL, HORIZONTAL OUTPUT, VERTICAL OUTPUT, CHROMINANCE, POWER, AUDIO

NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

— A BOARD —



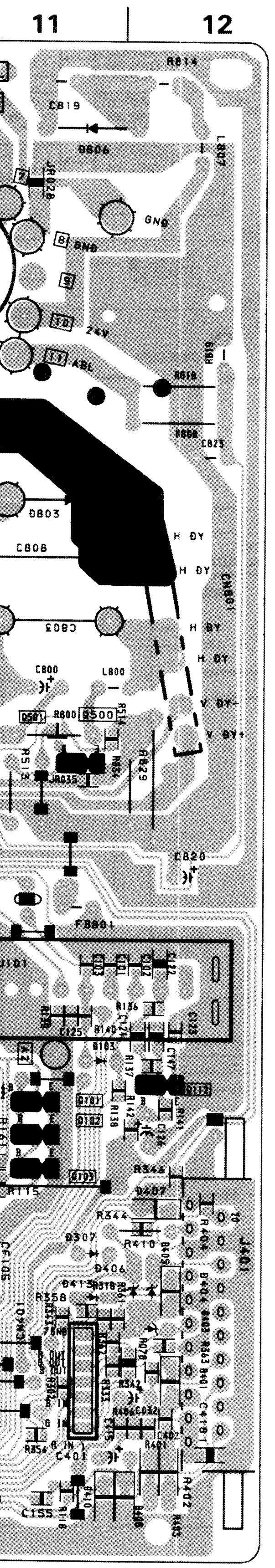
A BO

C016
C017
C112
C114
C116
C120
C131
C151
C153
C164
C322
C348
C349
CF101
CF102
CF103
CF104
CF105
CN201
CN602
D105
D106
D109
D307
D308
IC001
IC101
IC301
JR011
L108
L802
Q111
Q113
Q307
Q308
R006
R123
R134
R143
R144
R145
R147
R149
R151
R153
R157
R158
R161
R180
R326
R327
R347
R348
R349
R350
R351
R410
RV102
SWF101
TU101
X301

A BO

KV-21
KV-21

tage of over
tric shock in



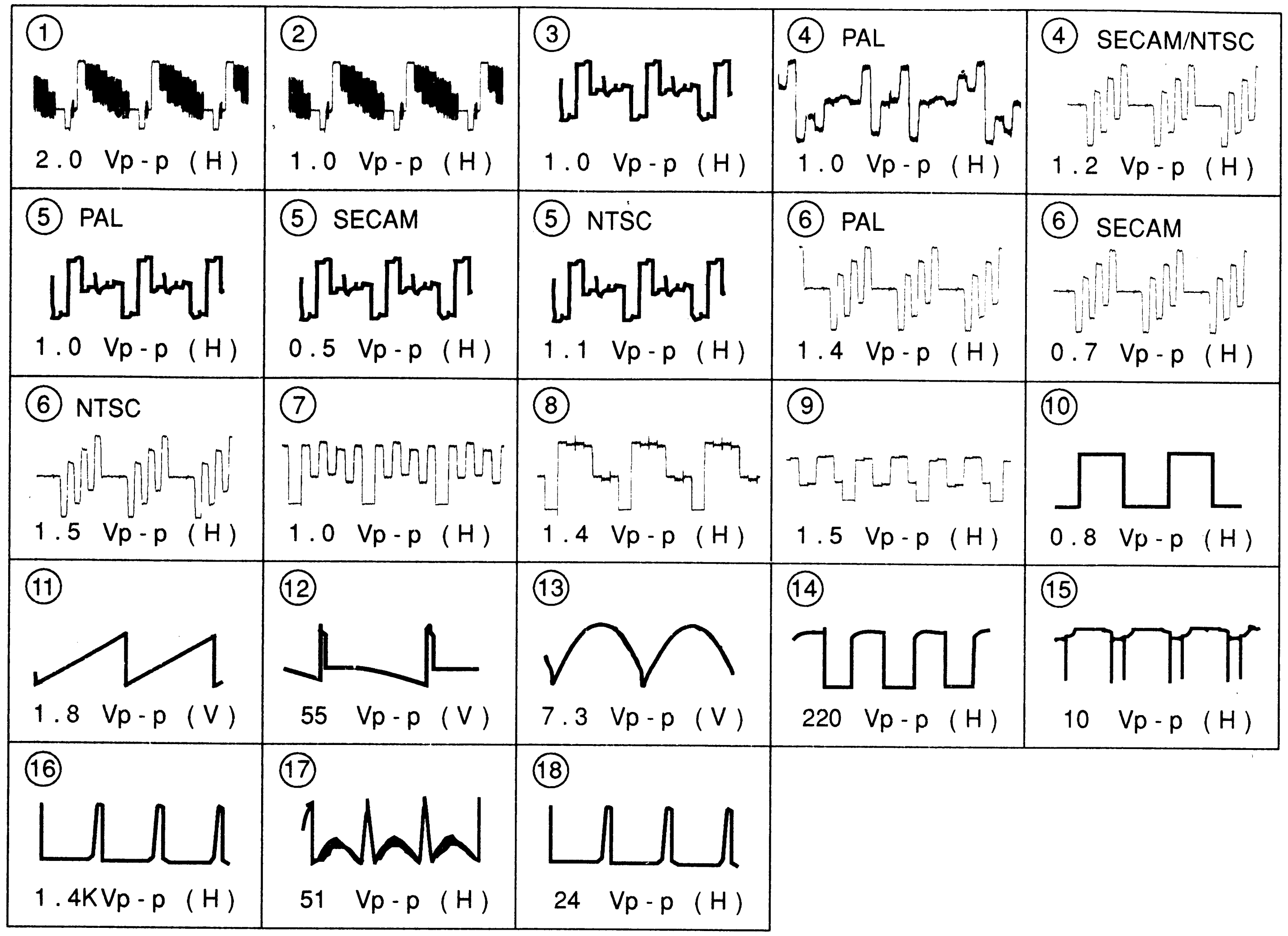
A BOARD * MARK

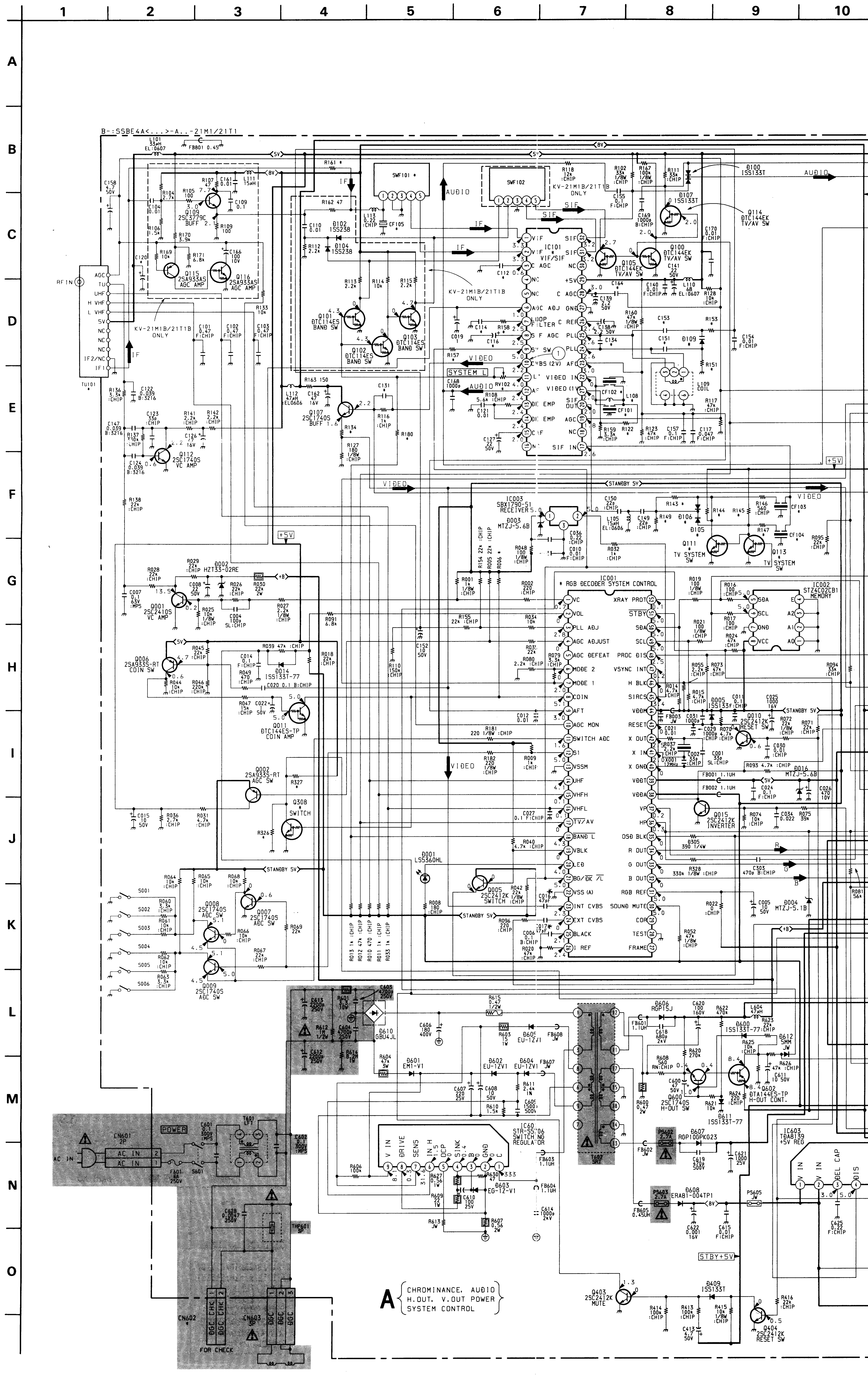
	21M1A/21T1A	21M1B/21T1B	21M1D/21T1D	21M1E/21T1E	21M1K/21T1K	21M1L/21T1L	21T1R	21M1U/21T1U
C016	0.47MF	0.47MF	0.47MF	0.47MF	0.47MF	0.47MF	—	0.47MF
C017	0.47MF	0.47MF	0.47MF	0.47MF	0.47MF	0.47MF	—	0.47MF
C112	—	0.1MF	—	—	—	—	—	—
C114	0.22MF	0.1MF	0.22MF	0.22MF	0.22MF	0.22MF	0.22MF	0.22MF
C116	—	2.2 50V	—	—	—	—	—	—
C120	1000MF 10V	1000MF 10V	1000MF 10V	470MF 10V	470MF 10V	470MF 10V	470MF 10V	470MF 10V
C131	—	—	—	—	0.001MF	—	0.001MF	—
C151	—	—	—	—	0.001MF	0.001MF	0.001MF	0.001MF
C153	—	—	—	—	15PF	15PF	15PF	15PF
C164	—	1MF	—	—	—	—	—	—
C322	—	—	—	—	18PF	—	18PF	—
C348	—	0.01MF	—	—	—	—	—	—
C349	—	22MF 50V	—	—	—	—	—	—
CF101	5.5/5.74MHz	5.5/6.5MHz	5.5/5.74MHz	5.5/5.74MHz	5.5/5.74MHz	6.0/6.5MHz	5.5/5.74MHz	6.0/6.5MHz
CF102	—	—	—	—	6.5MHz	—	6.5M,Hz	—
CF103	5.5MHz	5.5MHz	5.5MHz	5.5MHz	5.5MHz	6.0MHz	5.5MHz	6.0MHz
CF104	—	—	—	—	6.5MHz	—	6.5M,Hz	—
CF105	—	5.5MHz	—	—	—	—	—	5.5MHz
CN201	3P	3P	4P(M1) ,3P(T1)	3P	4P	3P	4P	3P
CN602	2P	2P	2P	2P	—	—	—	—
D105	—	—	—	—	1SS133T	—	1SS133T	—
D106	—	—	—	—	1SS133T	—	1SS133T	—
D109	—	—	—	—	1SV214	1SV214	1SV214	1SV214
D307	—	1SS133T	—	—	—	—	—	—
D308	—	1SS133T	—	—	—	—	—	—
IC001	Refer to "A board * mark-2" table							
IC101	TDA9806	TDA9812	TDA9806	TDA9806	TDA9806	TDA9806	TDA9806	TDA9806
IC301	MC44007P	MC44002P	MC44002P	MC44007P	MC44002P	MC44007P	MC44002P	MC44007P
JR011	–	0 : CHIP	–	–	–	–	–	–
L108	8.2μH	8.2μH	8.2μH	8.2μH	4.7μH	8.2μH	4.7μH	8.2μH
L802	CHOKE COIL	CHOKE COIL	CHOKE COIL	CHOKE COIL	AIR-CORE COIL	AIR-CORE COIL	AIR-CORE COIL	AIR-CORE COIL
Q111	–	–	–	–	DTC144ES	–	DTC144ES	–
Q113	–	–	–	–	DTC144ES	–	DTC144ES	–
Q307	–	2SA933AS	–	–	–	–	–	–
Q308	–	DTC144EK	DTC144EK	–	DTC144EK	–	DTC144EK	–
R006	47K	33K	33K	47K	33K	47K	33K	47K
R122	150	150	150	150	100	150	100	150
R134	180	180	180	180	180	150	180	150
R143	0	0	0	0	0	0	2.2K	0
R144	–	–	–	–	2.2K	–	2.2K	–
R145	–	–	–	–	2.2K	–	2.2K	–
R147	–	–	–	–	560	–	560	–
R149	–	–	–	–	2.2K	–	2.2K	–
R151	–	–	–	–	100K	100K	100K	100K
R153	–	–	–	–	100K	100K	100K	100K
R157	–	1K	–	–	–	–	–	–
R158	390	180	390	390	390	390	390	390
R161	0 : CHIP	–	0 : CHIP	0 : CHIP	0 : CHIP	0 : CHIP	0 : CHIP	0 : CHIP
R180	–	1K	–	–	–	–	–	–
R326	–	82K	82K	–	82K	–	82K	–
R327	–	100K	100K	–	100K	–	100K	–
R347	–	470	–	–	–	–	–	–
R348	–	10K	–	–	–	–	–	–
R349	–	220K	–	–	–	–	–	–
R350	–	220	–	–	–	–	–	–
R351	–	8.2M	8.2M	–	8.2M	–	8.2M	–
R410	75	75	75	75	75	68	75	68
RV102	–	22K	–	–	–	–	–	–
SWF101	OPWG1963	OFWK3953	OPWG1963	OPWG1963	OFWK2950	OFWJ1952M	OFWK2950	OFWJ1952M
TU101	BT-AC401	TELE4-002B	TELE4-002B	BT-AC401	BT-AC401	UV1315	TELE4-002B	BT-AU601
X301	–	–	–	–	14.32MHz	–	14.32MHz	–

A BOARD * MARK-2 (IC001)

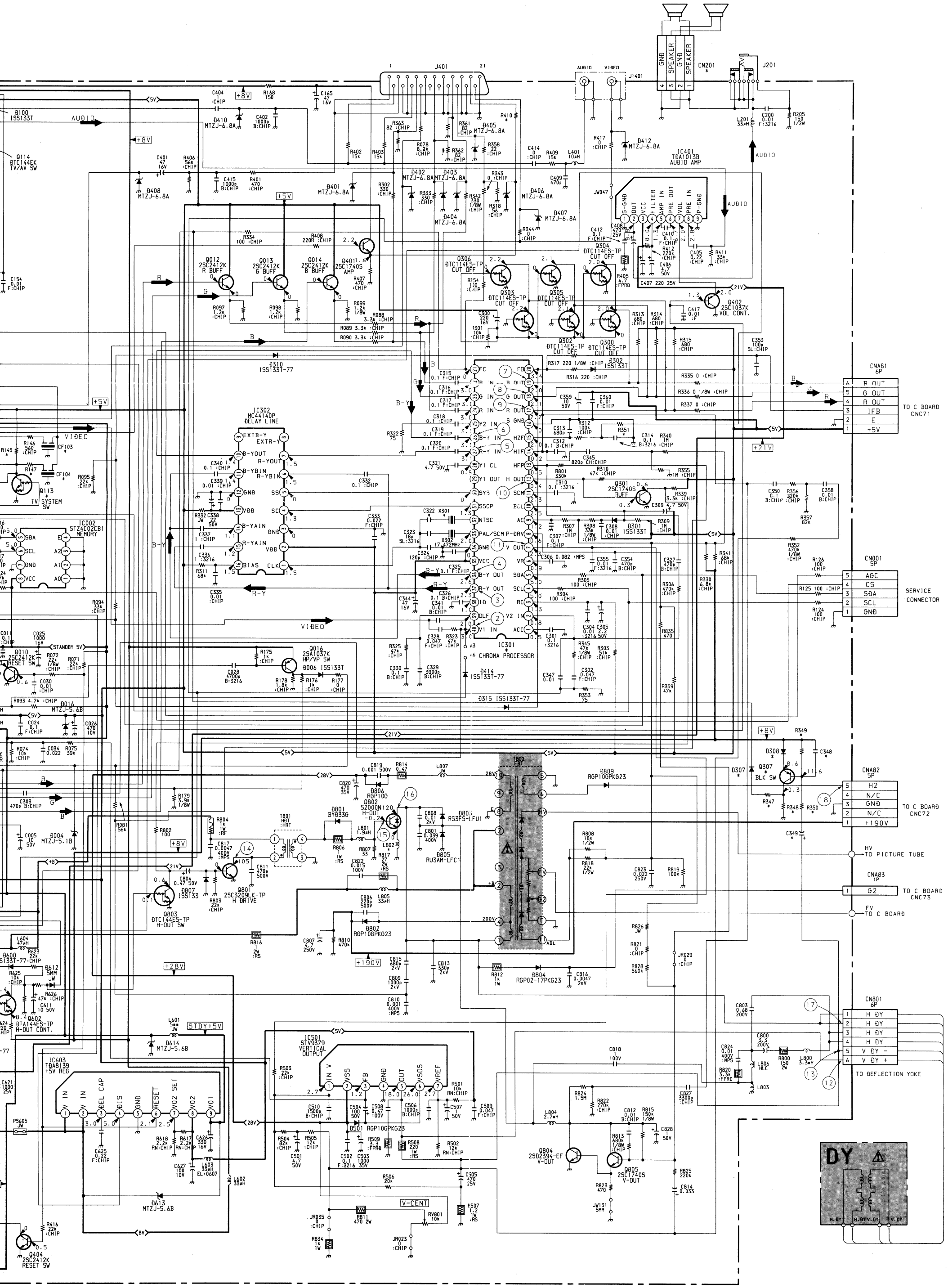
KV-21M1A/21M1B/21M1D/21M1E/21M1K/21M1L/21M1U	SAA5288ZP/014
KV-21T1A/21T1B/21T1D/21T1E/21T1K/21T1L/21T1R/21T1U	SAA5290ZP/014

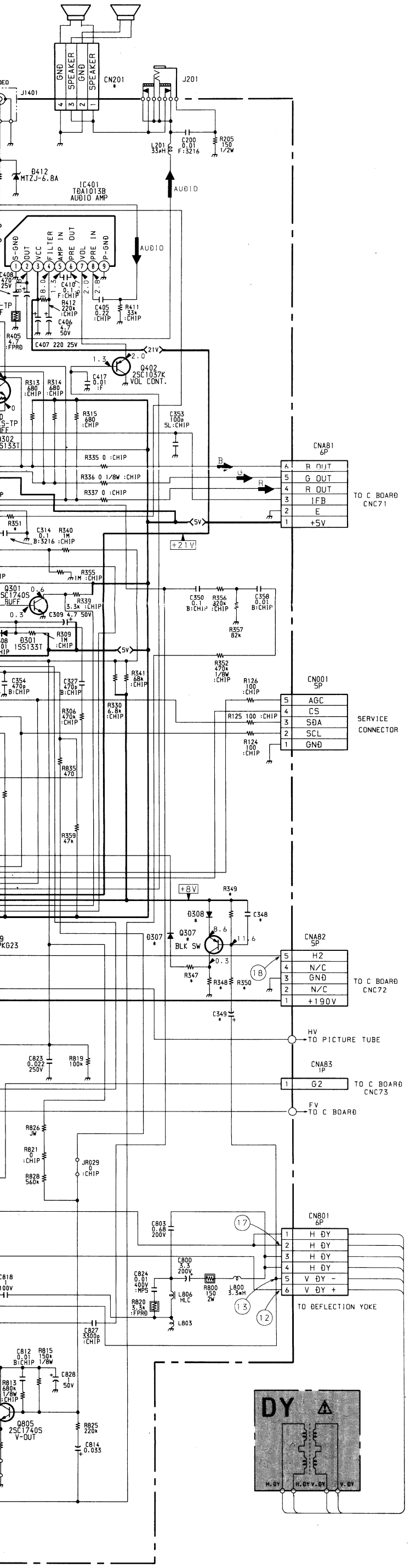
WAVEFORMS A BOARD



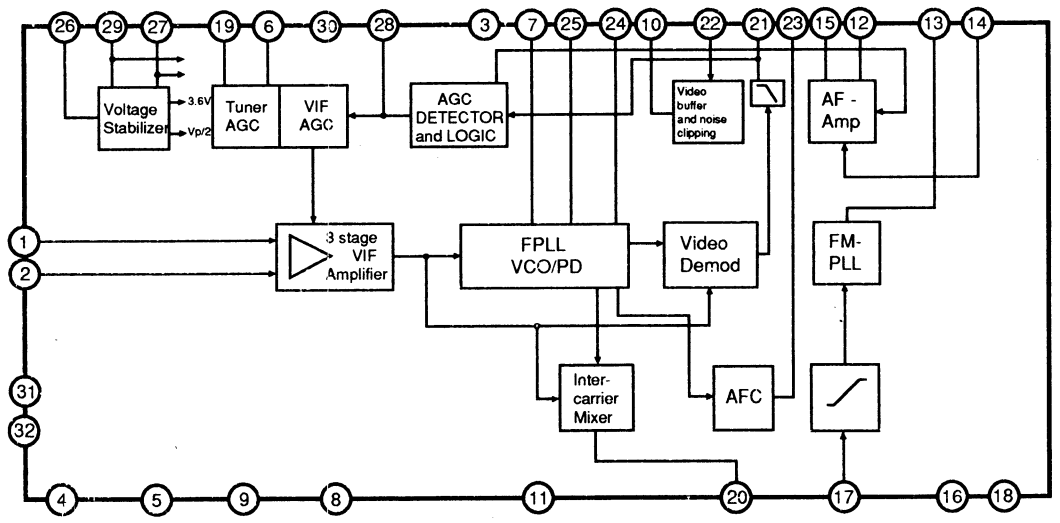


1 2 3 4 5 6 7 8 9 10
A B C D E F G H I J K L M N O
B-:SSBE4A<...>-A..-21M1/21T1
TU101
RF IN
AGC
TU
UHF
H VHF
L VHF
5V
NC
IF2/NC
IF1
KV-21M1B/21T1B ONLY
Q109 2SC3779C BUFF
Q115 2SA933AS AGC AMP
Q116 2SA933AS AGC AMP
Q101 DTC114ES BAND SW
Q102 DTC114ES BAND SW
Q103 DTC114ES BAND SW
Q107 2SC1740S BUFF
Q112 2SC1740S VC AMP
SWF101
SWF102
IC101 VIF/SIF
D100 1SS133T
D107 1SS133T
Q114 DTC144EK TV/AV SW
Q100 DTC144EK TV/AV SW
Q105 DTC144EK TV/AV SW
L109 COIL
SYSTEM L
AUDIO
VIDEO
IF
SIF
STANDBY 5V
IC003 SBX1790-51 RECEIVER
D003 MTZJ-5.6B
Q111 TV SYSTEM SW
Q113 TV SYSTEM SW
IC001 RGB DECODER SYSTEM CONTROL
IC002 STZ4C02CB1 MEMORY
Q001 2SC2410S VC AMP
D002 HZT33-02RE
Q006 2SA933S-RT COIN SW
D014 1SS133T-77
Q011 DTC144ES-TP COIN AMP
Q002 2SA933S-RT AGC SW
Q308 SWITCH
Q008 2SC1740S ADC SW
Q007 2SC1740S ADC SW
Q009 2SC1740S ADC SW
S001 S002 S003 S004 S005 S006
D001 LS5360HL
Q005 2SC2412K SWITCH
D005 1SS133F
Q010 2SC2412K RESET SW
Q015 2SC2412K INVERTER
D016 MTZJ-5.6B
D004 MTZJ-5.1B
X001 12MHz
POWER
CN601 2P
AC IN
F601 4A 250V
S601
T601 LFT
D610 GBU4JL
THP601 3P
CN602
CN603 3P
DGC CHK
FOR CHECK
IC60 STR-S5706 SWITCHING REGULATOR
T602 SRT
D601 EM1-V1
D602 EU-1ZV1
D604 EU-1ZV1
D605 EU-1ZV1
D603 EG-1Z-V1
D606 RGP15J
D600 1SS133T-77
D612 5MM JW
Q600 2SC1740S H-OUT SW
Q602 DTA144ES-TP H-OUT CONT.
D611 1SS133T-77
D607 RGP10GPKG23
D608 ERA81-004TP1
PS602 2.7A
PS603 2.7A
PS605 JW
IC603 TDA8139 +5V REG
STBY+5V
Q403 2SC2412K MUTE
D409 1SS133T
Q404 2SC2412K RESET SW
A
CHROMINANCE, AUDIO
H.OUT, V.OUT POWER
SYSTEM CONTROL

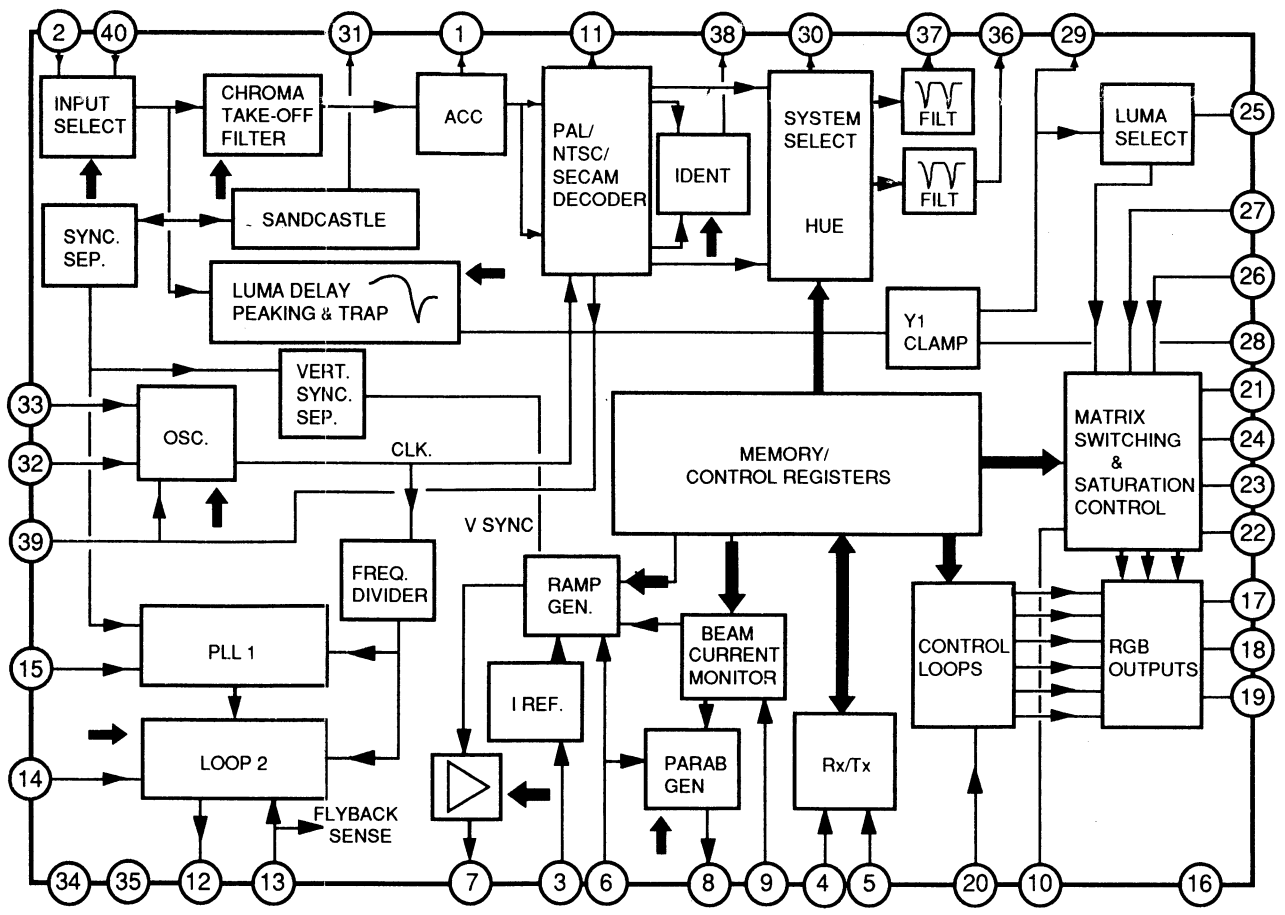

J401
J1401
CN201
J201
AUDIO
VIDEO
GND
SPEAKER
IC401
TDA1013B
AUDIO AMP
IC302
MC44140P
DELAY LINE
IC002
ST24C02CB1
MEMORY
IC301
CHROMA PROCESSOR
IC501
STV9379
VERTICAL
OUTPUT
IC603
TDA8139
+5V REG
Q803
DTC144ES-TP
H-OUT SW
Q804
2SD2394-EF
V-OUT
Q805
2SC1740S
V-OUT
Q802
S2000N120
H-OUT
Q801
2SC3209LK-TP
H DRIVE
T801
HOT
T802
FBT
CNA81
6P
R OUT
G OUT
R OUT
IFB
E
+5V
TO C BOARD
CNC71
CN001
5P
AGC
CS
SDA
SCL
GND
SERVICE
CONNECTOR
CNA82
5P
H2
N/C
GND
N/C
+190V
TO C BOARD
CNC72
HV
TO PICTURE TUBE
CNA83
1P
G2
TO C BOARD
CNC73
FV
TO C BOARD
CN801
6P
H DY
H DY
H DY
H DY
V DY -
V DY +
TO DEFLECTION YOKE
DY
STANDBY 5V
STBY+5V
+8V
+5V
+28V
+21V
+190V
V-CENT



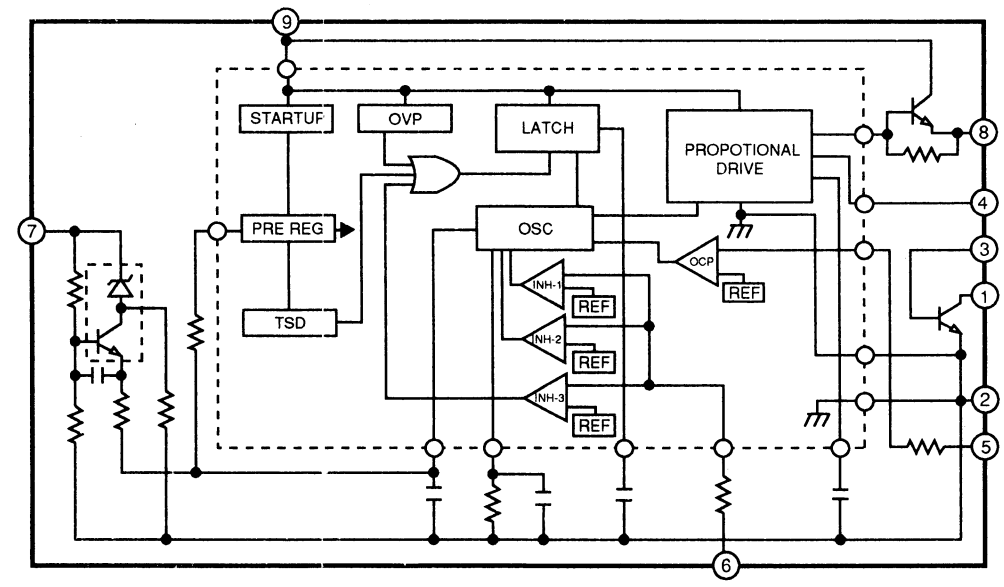
A BOARD IC101 TDA9806/TDA9812



A BOARD IC301 MC44002P/MC44007P

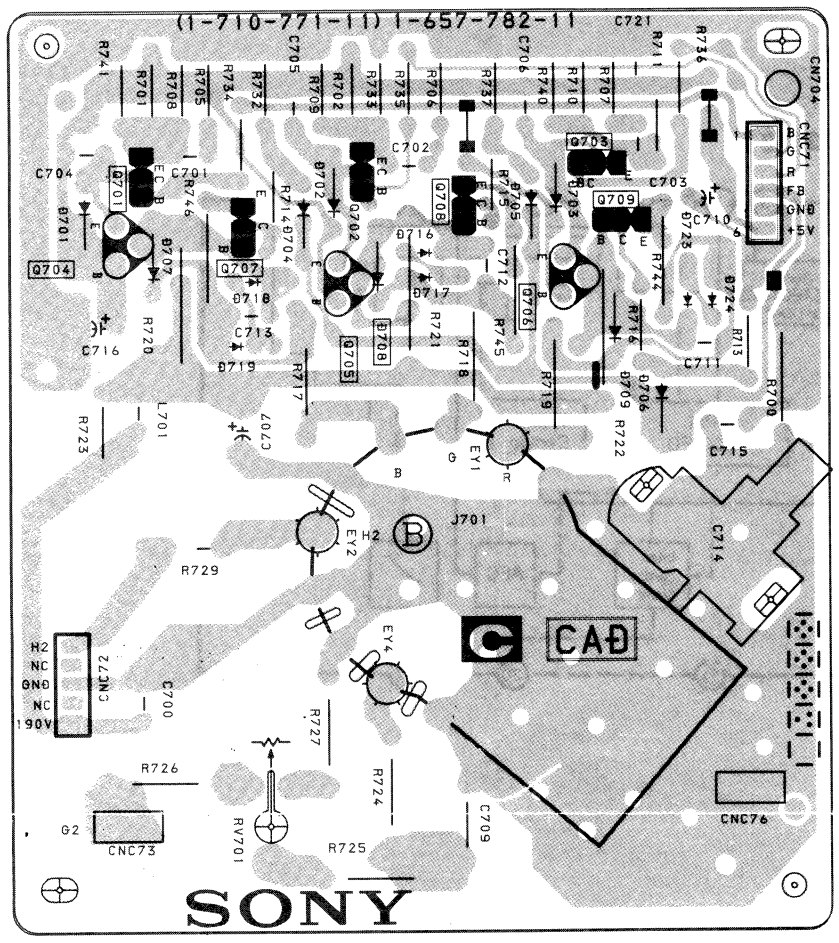


A BOARD IC601 STRS5706



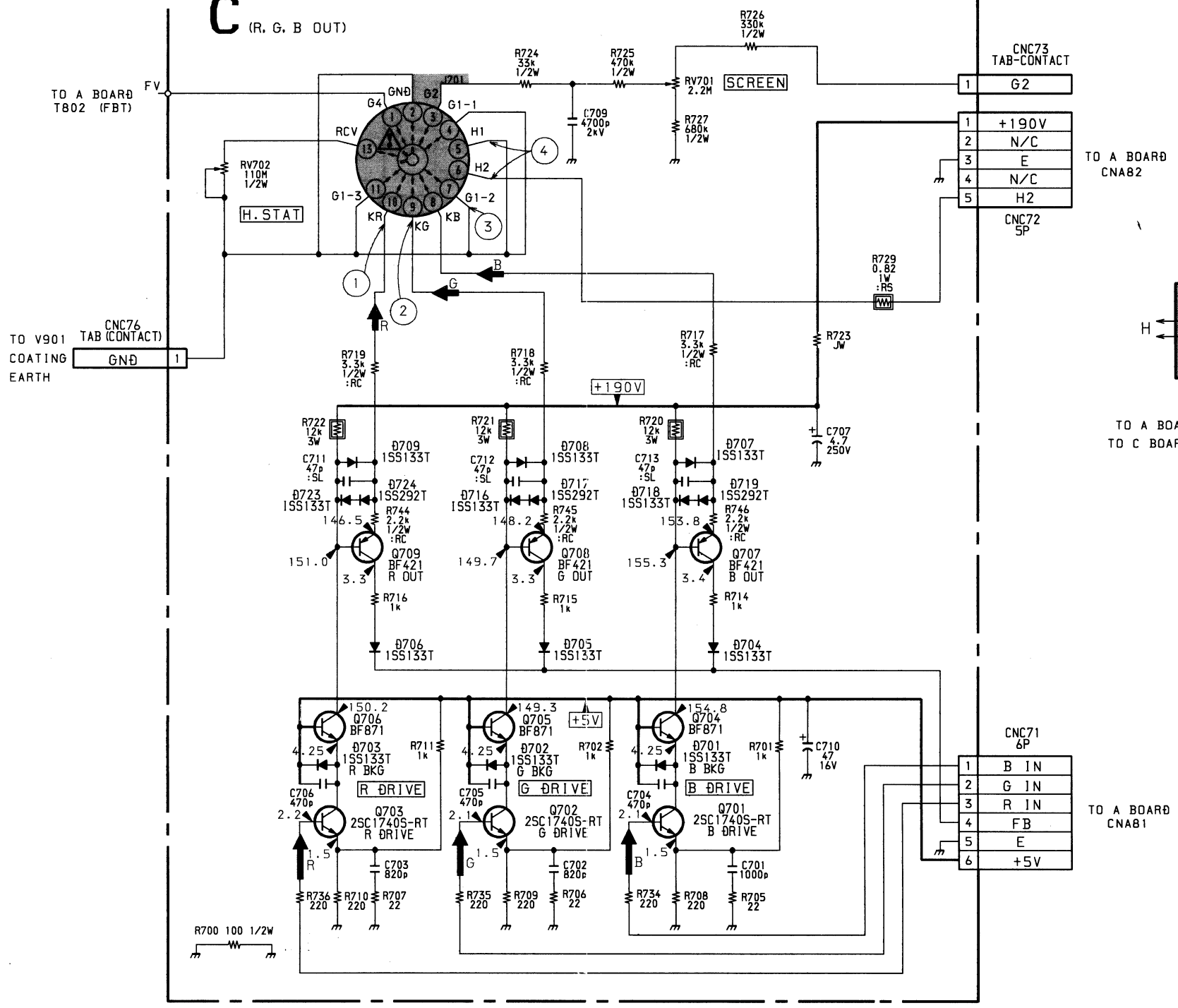
C [R.G.B OUT]

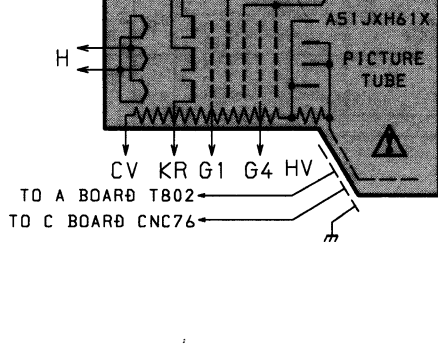
— C BOARD —



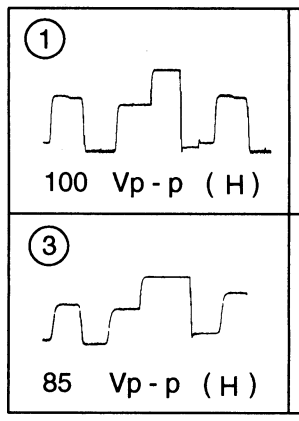
B-:SSBE4A<...>-C..-21M1/21T1

C (R. G. B OUT)





WAVEFORMS C BOAR

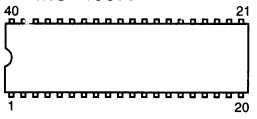


FORMS C BOARD

Vp-p (H)	② 96 Vp-p (H)
Vp-p (H)	④ 23 Vp-p (H)

5-4. SEMICONDUCTORS

MC44002P
MC44007P



(TOP VIEW)

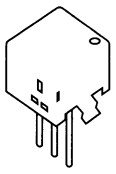
MC44140P

(TOP VIEW)

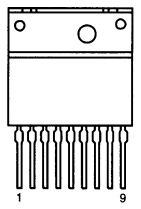
SAA5288ZP/014
SAA5290ZP/014

(TOP VIEW)

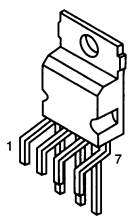
SBX1790-51



STR-S5706



STV9379



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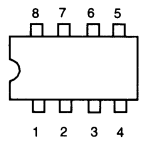
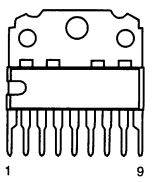
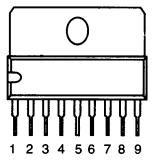


(TOP VIEW)

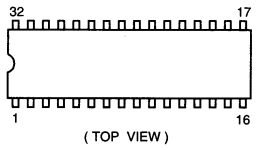
TDA1013B



TDA8139

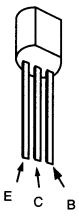


TDA9806
TDA9812

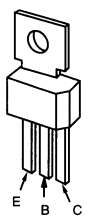


(TOP VIEW)

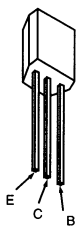
BF421
2SA1091-O



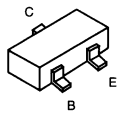
BF871-127



DTA144ES
DTC114ES
DTC144ES



DTC144EK
2SA1162-G
2SA1037K
2SC2412K-QR



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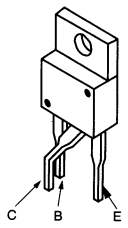

2SA933AS
2SA933S
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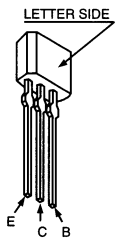
2SC2410SN



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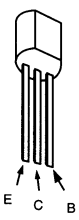

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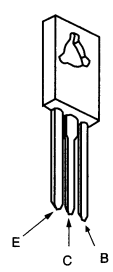

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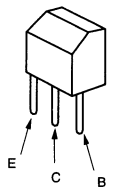

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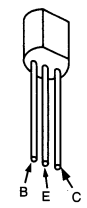

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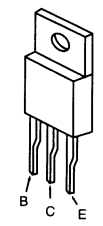

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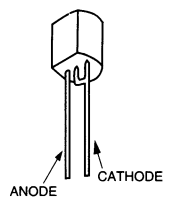

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EL1Z	RGP10GPKG23
EM1-V1	RGP15J-6040FG23
ERC06-15S	RU3AM
ERD28-06S	1SS168
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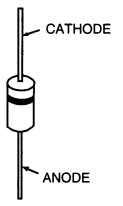

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MTZJ-5.1B	RD6.8ESB2
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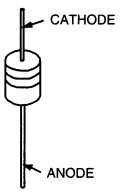

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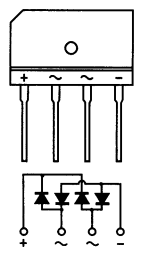

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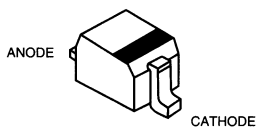

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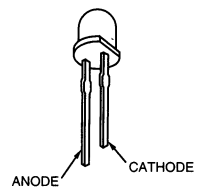
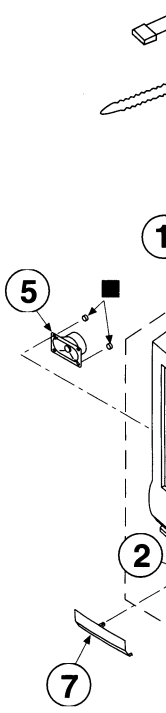


NOTE :

- Items with no pa
  are seldom requ
- The constructio
  number in the re
- Items marked "
  routine service.
  items.

6-1. CHASS

■ : +BV
● : +BV



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3	4-20
4	*4-20
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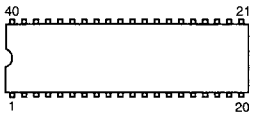
6	1-50
	1-50
7	4-20
	4-20
	4-20

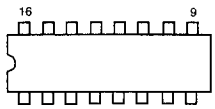
5-4. SEMICONDUCTORS

MC44002P
MC44007P



(TOP VIEW)

MC44140P



(TOP VIEW)

SAA5288ZP/014
SAA5290ZP/006
SAA5290ZP/014

(TOP VIEW)

SBX1790-11
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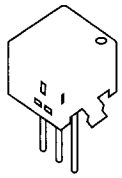
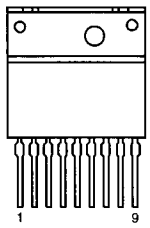


STR-S5706



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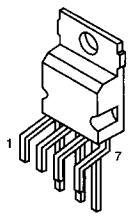

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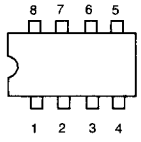

(TOP VIEW)

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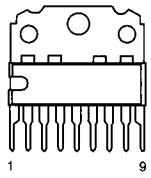

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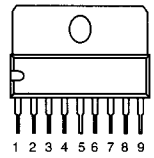

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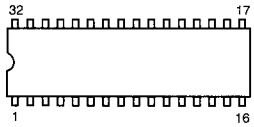

(TOP VIEW)

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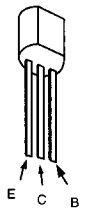
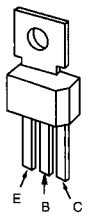


BF871-127



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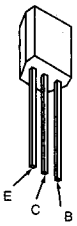

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JC501-Q 2SC1740S
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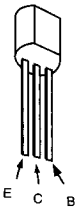

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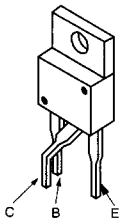

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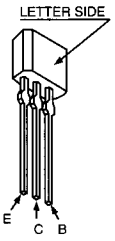

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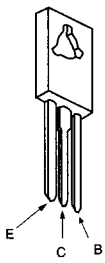

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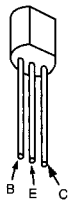

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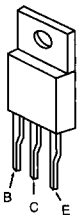

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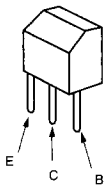

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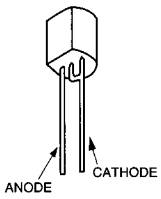

BYD33G ERD28-08S
EG-1Z-V1 EU-1Z
EGP20G RGP02-17EL-6433
EL1Z RGP0217PKG23
EM1-V1 RGP10GPKG23
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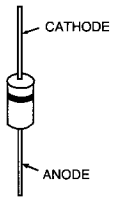

ERA81-004 RD5.1ESB2
ERA83-006 RD6.8ESB2
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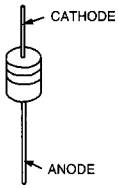

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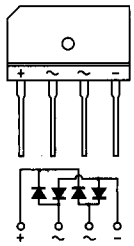

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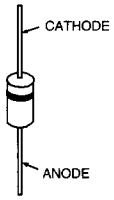

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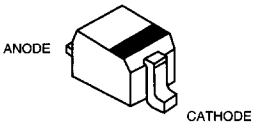

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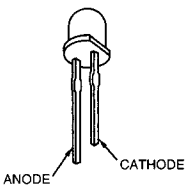

6-1. CHASSIS AND PICTURE TUBE

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■ : +BVTP 3X12 7-685-648-79